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STATE OF MONTANA

Department of Public
Instruction

ARBOR DAY MANUAL

*"A man who plants a tree and cares for it has
added at least his mite to God's Creation."*

State Flower:

The Bitter Root:

"Lewisia Rediva"



ARBOR DAY

MAY 14, 1912

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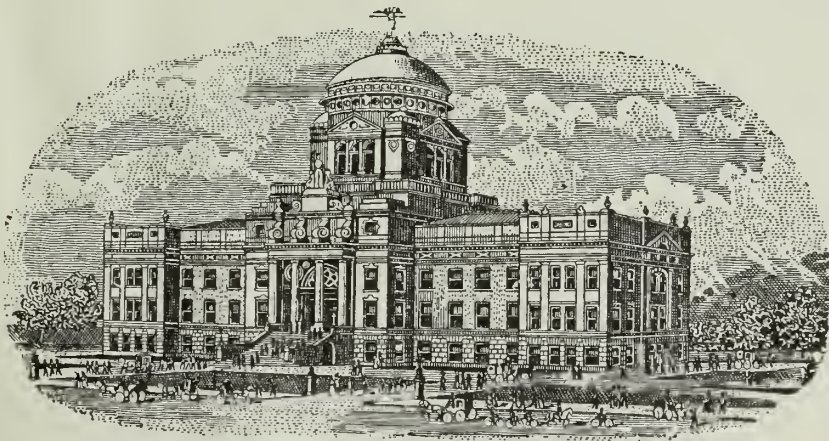
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ARBOR DAY PROCLAMATION.

Mindful of the passing of winter and what it portends, I Edwin L. Norris, as Governor of the State of Montana, do hereby designate and set apart Tuesday, the fourteenth day of May, one thousand nine hundred and twelve, as Arbor Day.

And I do earnestly recommend that the occasion be given genuine observance, by the planting of tree and shrub and vine and by such other efforts as will tend to make our homes, whether we dwell in city or country, the brighter and happier for the coming of this day.

IN WITNESS WHEREOF I have hereunto set my hand and caused the Great Seal of the State to be affixed.

Done at Helena, the Capital, this the fourth day of April, in the year of our Lord one thousand nine hundred and twelve.

(Signed.) EDWIN L. NORRIS.

By the Governor:

T. M. SWINDLEHURST,
Secretary of State.

In freedom's air we plant the tree,
Our land of hope, America;
Beneath the blue sky, freedom's dome,
Within the green earth, freedom's home,
We plant the tree for years to come,
And pray, God bless America.

—Hezekiah Butterworth.

TO DISTRICT CLERKS AND TEACHERS:

You are hereby requested and urged to keep and preserve the annual numbers of the Arbor Day Manual as a part of the school library.

The material found in them has been selected and obtained from a large number and variety of sources with the object of providing a permanent collection of literature for the use of both teacher and pupil in the future in connection with the observance of Arbor Day.

The program herein outlined is suggestive only, and should be modified to meet the conditions existing in each school district.

W. E. HARMON,

Superintendent of Public Instruction.

Helena, Montana, April 4, 1912.

A light broke in upon my soul—
It was the carol of a bird;
It ceased—and then it came again,
The sweetest song ear ever heard.
—Byron.

LETTER OF STATE SUPERINTENDENT.

Helena, Montana, April 10, 1912.

Dear Girls and Boys of Montana:

Arbor Day has come again. What are you going to do to make the day memorable? Did you do anything last year or the year before to commemorate the day? I hope you planted some tree or shrub or some flower and tended it with care. If you did I am sure you are glad to have Arbor Day come yearly. The legislature set apart this day not as a day to be idled away thoughtlessly but as a day for adorning, beautifying, and changing. You are asked to change your thoughts and activities from regular school duties to those of a special nature. Look around you and see if there are not changes you can make that will be a credit to your thoughts, energy, and care.

I have advised you in years gone by that you must plant and tend with care if you wish to accomplish anything of a permanent character. In this state we do not have plants and wild flowers growing in profusion, but we may have beautiful lawns, and trees and flower gardens if we choose.

I hope some of you have been privileged to visit cities and parks. I know you have enjoyed the trees, the lawns, the drives, the fountains, and all other attractions. Remember the most of these have been the outcome of thought and care on the part of some public spirited citizens. You too are citizens. Are you public spirited? Your deeds will answer this question. The songs you sing today, the memory gems you give today, all the Arbor Day spirit you manifest today should contribute to a better citizenship. If you see nothing around your school grounds that you can change for the better, can you not make some changes at home, or on the way home for the better? There are many unsightly places in many neighborhoods that could be made with a little care to add to the beauty of the country. As you have been diligent in your studies on regular school days, the same diligence spent in careful thought in planting, trimming, pruning, watering and tilling, will soon bring you well merited reward.

Cordially your friend,

W. E. HARMON.

THE MEANING OF ARBOR DAY.

What does Arbor Day mean to you? A day's vacation? A chance to wear your best clothes and have a part on the program? A rather dull time sitting in your seats and listening to your schoolmates? If that is all it hardly is worth while, is it? The legislatures of nearly all the states have taken time to discuss this question of Arbor Day and have passed laws providing for its observance. Nearly every state Department of Education publishes a little book similar to this one to help the boys and girls and teachers of the state to arrange and present interesting and instructive programs on that day. There must be a good reason for having Arbor Day.

Do you need to be told that there are many good reasons? I do not think so. If you will read this book you will find them. Still better if you will look about you, you will find them. In the grateful shade of a tree in the heat of summer or in its shelter in the cold of winter; or in the joy which trees give you by the beauty they add to our yards, our streets, our valleys and our mountains; in the innumerable objects of wood by which we are surrounded; in the nuts and fruits which furnish the world so large a share of its best food; this very book, like nearly all of your books, was once a part of a growing tree; in all these things and many more, if you will stop to think, you will see the reasons for Arbor Day.

If you live in a region where there are few trees you will readily appreciate their value and the importance of preserving those you have and adding more. Have you ever seen a shadeless school ground in the glare of the summer sun, or bleak and bare in a winter wind? What a change it would make in that school ground, how much pleasanter a place to go to school, if it were like some other grounds you have seen, well set with trees and sheltered, perhaps, by a wind break of poplars or firs. Don't you think it would be a fine thing to begin this year to plant some trees for the pleasure and comfort of the boys and girls who will follow you?

If you live in a region where there are many trees, you ought not therefore to be indifferent to them but all the more to appreciate your good fortune in the pleasure and comfort and employment which forests bring. Even where you are, trees will not grow along your streets and in your yards, just where you want them, unless you plant and encourage. One

of the saddest sights is a yard without trees in a region once heavily timbered. Many of our people make the mistake, both in the home yard, and in the school yard, of cutting away every tree. If that has been done at your school yard or at your home, can you think of anything which you can do that will furnish as much pleasure for many, many years to come, to yourself and others, children and grownfolks, as the simple planting and caring for a tree?

Our towns and cities are spending many thousands of dollars in planting and caring for trees along their streets. The United States and the states are spending many millions in planting and caring for trees in our great forests. You can help by being careful not to injure the young trees on the streets, or to leave your camp fire burning in the woods. The trees in town will make our streets beautiful and comfortable; the trees in the forests will make our hills and mountains beautiful and furnish thousands of men with work.

Arbor Day is to make us think about trees and their value to us. But it will hardly be worth while unless it helps us to act right toward trees all the year round.

THE LINDEN.

I planted a linden tree to-day,
Bare and brown 'gainst a sky of gray.
Its leafless branches are stretched in prayer,
Begging an alms of the sun and the air.
It is striking its roots in the breast of the earth.
Patiently waiting the spring's new birth;
And down the aisles of the years to be,
I look and I find my linden tree,
Tall and leafy and flowry, fair;
For many a spring has answered its prayer.
'Tis a trysting-place for the lover and maid;
And children are playing beneath its shade.
Like gold-green cencers its blossoms swing,
And birds come round it to build and sing.
Its leaves are a harp for the playing breeze;
Nectar is there for the murmuring bees;
And a poet seeks it alone and apart,
With a song on his lips and a dream in his heart.
These are things that shall one day be,
Because I have planted a linden tree.

—By the Author of "Aunt Jane, of Kentucky."

OUT IN THE FIELDS.

The little cares that fretted me,—
I lost them yesterday
Among the fields above the sea,
Among the winds at play,
Among the lowing of the herds,
The rustling of the trees,
Among the singing of the birds,
The humming of the bees.

The foolish fears of what might happen—
I cast them all away
Among the clover scented grass,
Among the new-mown hay,
Among the husking of the corn
Where drowsy poppies nod,
Where ill thoughts die and good are born,—
Out in the fields with God.

—Elizabeth Barrett Browning.

THE SPREAD OF THE ARBOR DAY IDEA.

Arbor Day originated in treeless Nebraska in 1872. Its great advocate was the Hon. J. Sterling Morton. Mr Morton had the imagination to forsee the transformation which trees would work on the vast prairies of his state, the faith to believe that they could be made to grow, in spite of expert opinion to the contrary, and the ability to persuade others to imagine and believe like him.

Anyone who has travelled across Nebraska or its neighbor states in recent years can testify to the delightful results of the agitation thus started. Everywhere the landscape is dotted with villages, farms, and school yards, each distinguishable from the surrounding prairie by the rows of splendid trees, furnishing shade, ornament and shelter.

Other states were not slow to appreciate the value of Nebraska's achievement. First her neighbors and then rapidly more distant states passed legislation modeled after the Nebraska statute but adjusted to local conditions.

The agitation thus begun and spread among the states was certain ultimately to make itself felt in the nation. If it was of such importance to the states to protect and multiply their trees, it was evidently of equal importance for the people as a whole to protect and multiply those upon the national domain. The conservation of our forests called attention to other forms of national wealth that were being squandered and is leading to the protection of our coal, oil, and mineral lands and our waterpower from improper exploitation. It is possible to trace a very close connection between the modest beginnings of Arbor Day in Nebraska and the whole conservation policy.

THE FRIENDLINESS OF TREES.

Did you ever stop to think what good friends of us all the trees are? Did you ever know a tree to refuse to let boys and girls enjoy its shade? Did you ever know a tree to refuse even to give up its life that we might have wood to burn or use? Did you ever know a tree to decline to give the birds a place to rest or shelter from the storm? Did you ever see a great spreading tree in a city park and think of the thousands of boys and girls who year after year and generation after generation find health and comfort and happiness in its shade? Did you ever know a boy or girl to cut or hack or beat or swing upon a young tree, killing it or crippling it for life? What do you really think of people who treat their friends that way? A tree is one of your best friends. Treat it like a friend.

A FEW POINTERS ON PLANTING TREES.

1. Trees are best when nursery grown.
2. Trees transplanted from the woods should be seedlings.
3. A tree two inches in diameter measured one foot from the ground is large enough.
4. Trees should have a compact root system, straight main trunk and well balanced top.
5. The lower branches should be trimmed to a height of seven feet from the ground.
6. Trees should be free from fungus and insect diseases.
7. Tree holes should be larger than required by the root system.
8. Trees should be planted with as large a root system as possible.
9. Prevent drying, sunburn or freezing of exposed roots.
10. Plant the tree at the same depth and exposure as it formerly stood.
11. Trim off all torn and broken roots and branches with sharp pruner before planting.
12. Plant no trees closer than twenty-five feet.
13. Arrange the roots to spread naturally in loose soil.
14. Tamp the soil well about the roots.
15. Water the young tree freely, especially during June, July and August, with one or two thorough waterings each week.
16. Keep the soil cultivated around young trees.
17. A serviceable and strong tree guard should be placed around the tree.

—J. H. PROST, City Forester, Chicago.

PLANTING A TREE.

What do we plant when we plant the tree?
We plant the ship which will cross the sea;
We plant the mast to carry the sails;
We plant the planks to withstand the gales;
The keel, the keelson, the beam and knee—
We plant the ship when we plant the tree.

What do we plant when we plant the tree?
We plant the houses for you and me;
We plant the rafters, the shingles, the floors,
We plant the studding, the lath, the doors,
The beams, the siding, all parts that be—
We plant the house when we plant the tree.

What do we plant when we plant the tree?
A thousand things that we daily see;
We plant the spire that out-towers the crag;
We plant the staff for our country's flag;
We plant the shade from the hot sun free—
We plant all these when we plant the tree.

LESSON OF THE DAY.

The lesson of Arbor Day is the use and value of the trees in the life of the Nation. It should therefore be the aim of the teacher so to observe the day as to convey this lesson clearly and impressively. The diversion of setting out a few trees, the exercises with which the school hours are enlivened, though all-important in exciting the interest and calling forth the enthusiasm of the pupils, may well be regarded as a means to the desired end rather than as the end itself. The sentiments and emotions aroused on Arbor Day pass only too quickly; the important thing is that permanent results be left—lasting impressions in the minds of the children, and, flourishing in the earth, an object lesson in a tree plantation of use or beauty, or both combined.

The tree that is significant in the life of the Nation is, of course, the forest tree. Isolated trees, along the roadside, in the city streets, or in the school yard, please the eye, and cool the air with their refreshing shade. But the forest of trees, where wood is growing to supply material for homes, for fuel, for a hundred industries; where the forest litter is storing the waters for streams to quench men's thirst, to irrigate their lands, to drive their mills, to fill their rivers deep for the vast traffic of inland navigation; in a word, the forest as producer and custodian of the necessities of life and happiness, is the true message of Arbor Day.

Forestry is based on this idea of the forest, and all its teachings aim to put this idea into actual practice. As a science, forestry secures the exact knowledge of forest life which makes it possible to cooperate with nature in bringing the forest to its very fullest use—

fulness as a source of wood, as a protection to the soil, or as a natural reservoir. As an art, forestry applies this knowledge for the good of mankind. Thus Arbor Day is the time for imparting especially to children such of the clearest and simplest of forest laws as their minds are ready to receive. It is, of course, impossible to go profoundly into the subject, and quite as unnecessary. But, however modest the work undertaken on Arbor Day, it is by no means difficult to make that work tell in the right direction by bringing home its connection with the larger and simpler truths of forestry. The planting of a few trees, without reference to the commercial utility and protective value of forests, is but a small part of the work of the day.

AN OBJECT LESSON IN FORESTRY.

What child has not seen a muddy freshet? Yet this sight, so common in the spring, is full of suggestion for a forest lesson. The stream is discolored by the the earth which it has gathered from the soil. This carries us back to the stream's source, in the forest springs. Again, it shows us with what force the water has rushed over the exposed ground where there was no forest to shield and bind it. In just this way the Mississippi tears down and flings into its bed, each summer, more soil than will be dredged with years of costly labor to make the Panama Canal. An experiment with fine and coarse soils stirred quickly in a tumbler of water and then allowed to settle explains how the stream continues muddy while it runs swiftly, and how it clears again as it slackens on more level stretches, dropping the soil to the bottom. On any steep, plowed hillside, or on any railroad or trolley embankment, exposed soil may be seen washing with the rain. A forest on a mountain slope may be pictured by a cloth upon a tilted table; then if water be poured on the higher edge it will creep downward through the cloth and drip slowly from the lower edge, as would rain falling upon the forest. If now the cloth be plucked off, and the water still poured, we may observe at once what happens when such a forest is destroyed.

PLANTING SUGGESTIONS.

Trees can not be thrust into a rough soil at random and then be expected to flourish. They should be planted in well-worked soil, well enriched. If the trees can not be set out immediately after being secured, the first step is to prevent their roots drying out in the air. This may be done by covering the roots with damp moss or rags or "heeling-in" the trees by burying the roots deep in fresh earth.

In planting they should be placed in such way¹ as to be at the same depth as they stood originally, after the soil settled down. Fine soil should always be pressed firmly—not made hard—about the roots, and two inches of soil at the top should be left very loose, to act as a mulch to retain the moisture.

Small seedlings may be secured easily and cheaply. If these are

set out in good numbers after the pattern of a commercial plantation they will become in due time a true forest on a small scale. No matter how few the trees, they may be made to illustrate planting for some useful purpose.

The scope of planting may sometimes be broadened by securing permission for the children to plant a small block of trees in some field unsuited for crops, and in this way the work can be done just as it would be done on a larger scale by the forester.

OUTSIDE THE SCOPE OF THE ACTUAL PLANTING, IT IS WELL TO BEAR IN MIND THAT ARBOR DAY IS NOT THE ONLY DAY IN THE YEAR ON WHICH TREES DESERVE TO BE REMEMBERED AND CARED FOR. THEY NEED CARE THROUGHOUT THE SEASON. WATCHING THE PLANTATION THRIVE UNDER RIGHT TREATMENT GREATLY ADDS TO THE EDUCATIONAL VALUE OF THE WORK, AND TO ITS SUCCESS, WHICH SHOULD BE ITS BEST LESSON.

It is all important that the plantation should serve as a model of what can be accomplished along these lines. Then, when the children are grown men and women, they will find great satisfaction in the work of their school days.

Approved: James Wilson, Secretary, Washington D. C., March 28, 1907.

MISCELLANEOUS.

New's Notes.

(From the Springville "Breeze.")

We're pleased to state that Mr. Wren
And wife are back, and at the Eaves.

The Robins occupy again
Their summer home at Maple Leaves.

The Garden restaurant reports
A fresh supply of angleworms.

The Elms—that fav'rite of resorts—
Has boughs to rent on easy terms.

We learn that Mrs. Busy Bee
Is still quite lame with frosted wings.

Ye Editor thanks Cherry Tree
For sundry floral offerings.

Down C'istern-way a water-spout
Has been a source of active floods.

We hear of rumored comings out
Of some of Springville's choicest buds.

In case you run across Green Lawn
Don't wonder why he looks so queer.

'Tis only that he's undergone
His first short hair-cut of the year.

—Edwin L. Sabin, from St. Nicholas.

FACTS ABOUT TREES FOR THE LITTLE ONES.

(A Recitation.)

1. Cutting down trees spoils the beauty of the landscape. I would not like to live where there were no trees.
2. There are few birds where there are no trees. They have no place to make their homes.
3. Taking away the trees takes away the protection from our tender fruit trees.
4. Where there are no trees the snows melt and go off too rapidly; the moisture that should sink into the soil is carried away in the floods.
5. Because our forests are taken away we have severe droughts every year.
6. One full grown elm tree gives out fifteen tons of moisture in twenty-four hours. A large sunflower plant gives off three pints of water in one day.
7. The trees give us lumber, fuel, wood, pulp for newspapers, cork, bark for tanning, wild fruits, nuts, resin, turpentine oils and various products for medicines.
8. We should have greater extremes of heat and cold if it were not for the trees and forests.
9. The leaves of trees catch the rain and hold it a little while; then they drop the water a little at a time; this is better for the ground.
10. The old leaves make a deep sponge carpet in the woods and this keeps the ground from freezing. If the earth does not freeze it takes up the rain better.
11. We might have dangerous floods if we did not have trees. The trunks and roots of trees stop the water that comes pouring down the hillside.
12. I will be very careful not to hurt any tree, but I will call every tree my friend.—Primary Education.

There is something unspeakably cheerful in a spot of ground which is covered with trees, that smiles amidst all the rigors of winter, and gives us a view of the most gay season in the midst of that which is the most dead and melancholy.—Addison.

Summer or winter, day or night,
The woods are an ever new delight;
They give us peace and they make us strong,
Such wonderful balms to them belong;
So, living or dying, I'll take mine ease
Under the trees, under the trees.

—R. H. Stoddard.

What conqueror in any part of Life's battle could desire a more beautiful, a more noble, or a more patriotic monument than a tree planted by the hands of pure and joyous children, as a memorial to his achievements.—H. J. Lossing.

While I live, I trust I shall have my trees, my peaceful idyllic landscape, my free country life, at least half the year; and while I possess so much, I shall own one thousand shares in the Bank of Contentment.—Bayard Taylor.

What earnest worker, with hand and brain, for the benefit of his fellow men, could desire a more pleasing recognition of his usefulness than the monument of a tree, ever growing, ever blooming, and ever bearing wholesome fruit.—Irving.

Father, thy hand hath reared these venerable columns, thou
Didst weave this verdant roof. Thou didst look down
Upon the naked earth, and, forthwith, rose
All these fair ranks of trees.

—Bryant.

For a solace rests on the paths of men
Wherever a tendril falls,
And the soul will rise to a higher plane
Wherever a straight tree calls.

—M. S. McKean.

The Oak is called the King of Trees,
The Aspen quivers in the breeze,
The Poplar grows up straight and tall,
The Pear tree spreads along the wall,
The Sycamore gives pleasant shade,
The Willow droops in watery glade,
The Fir tree useful timber gives,
The Beech amid the forest lives.

—Sara Coleridge.

“Behold the trees unnumbered rise,
Beautiful, in various dyes;
The gloomy pine, the poplar blue,
The yellow beech, the sombre yew,
The slender fir that taper grows,
The sturdy oak with broad spread boughs.”

—Leigh Hunt.

There is a pleasure in the pathless woods,
There is a rapture on the lonely shore,
There is society where none intrudes,
By the deep sea, and music in its roar:
I love not Man the less, but Nature more.

—Byron.

He that planteth a tree is a servant of God;
He provides a kindness for many generations,
And faces that he has not seen shall bless him.

—Henry Van Dyke.

Now rings the woodland loud and long,
The distance takes a lovelier hue,
And drowned in yonder living blue
The lark becomes a sightless song.

—Tennyson—In Memoriam

The robin, the forerunner of the spring,
The blue-bird with his jocund caroling,
The restless swallows building in the eaves,
The golden buttercups, the grass, the leaves,
The lilacs tossing in the winds of May,
All welcome this majestic holiday.

—Longfellow

He who plants a tree,
He plants love;
Tents of coolness spreading out above
Wayfarers, he may not live to see.
Gifts that grow are best;
Hands that bless are blest,
Plant; life does the rest.
Heaven and earth helps him who plants a tree,
And his work its own reward shall be.

—Lucy Larcom.

There was never mystery
But 'tis figured in the flowers;
Was never secret history
But birds tell it in the bowers.

—Emerson.

Give fools their gold and knaves their power;
Let fortune's bubbles rise and fall;
Who sows a field or trains a flower,
Or plants a tree, is more than all.

—Whittier.

The sweetest sound the whole year round—
'Tis the first robin of the spring!
The song of the full orchard choir
Is not so fine a thing.

E. C. Stedman.

And all the throng
That dwell in nests and have the gift of song;
Whose household words are songs in many keys,
Sweeter than instrument of man's ere caught;
Whose habitations in the tree-tops even
Are half-way houses on the road to heaven.

—Longfellow.

Among the beautiful pictures
That hang in memory's wall
Is one of a dim old forest
That seemeth best of all.

—Alice Cary.

When we stand with the woods around us,
And the great boughs overhead;
When the wind blows cool on our forehead,
And the breath of the pine is shed;
When the song of the thrush is ringing,
Wonderful, rich, apart—
Between the sound and the silence
Comes a sudden lift of the heart.

—Elizabeth K. Adams.

A people without children would face a hopeless future; a country without trees is almost as hopeless.

Forests which are so used that they cannot renew themselves will soon vanish, and with them their benefits.

A true forest is not merely a storehouse full of wood, but, as it were, a factory of wood, and at the same time a reservoir of water.

When you help to preserve our forests or to plant new ones you are acting the part of good citizens.—Theodore Roosevelt.

THE LESSON OF THE TREES.

The earth is glad in the sunshine
And beauty that's born of May;
The orchards are rosy with promise
In the peace of the sweet spring day;
And children are merry as blackbirds
That chatter by aldered brooks,
As they troop away to the woodland
To search through the wooded nooks.

For a tree to plant in the school-yard
On this beautiful day, to be
A pledge of faith in the future
And a hostage to memory;
A tree that shall stand as a symbol
Of the growing, broadening life,
As it spreads its limbs in the sunshine
Or withstands the tempest's strife.

There's a lesson of strength and beauty
That grows as the days go by,
In the trees the children are planting
Under the springtime sky.
May the lives of those who plant them
Grow strong and fair, to be
A blessing to all about them—
That's the lesson of the tree.

—EBEN E. REXFORD, in "The Wisconsin Agriculturist."

THE SHADE TREE.

"Many a traveler in the heat,
Finds the cooling shade most sweet,
Stops to rest within the shade
That some wayside tree has made,
Feels the moist and dewy air
From a hundred leaflets fair
Fan his heated brow today,
And I think I hear him say:
'Bless the hand that set that tree
On this sunny street for me.'"

THE CRY OF THE PINES.

Listen, the great trees call to each other,
'Is it come your time to die, my brother?"
And through the forest, wailing and moaning,
The hearts of the pines in their branches groaning—
"We die, we die!"

"We, who have watched the centuries dying,
The span of years as an arrow flying,
Ages seeming a day and a morrow;
Lo, we have reached the time of our sorrow—
"We die, we die!"

"We who have stood with our ranks unbroken,
Breasting the storms, a sign and a token
That the gale must cease, and the wild waves staying
Man, we shielded, is come and is slaying—
"We die, we die!"

THE PETITION OF THE BIRDS.

Written by Senator Hoar.

To the Great and General Court of Massachusetts:

We, the song birds of Massachusetts and their playfellows, make this our humble petition:

We know more about you than you think we do. We know that you are good. We have hopped about the roofs and looked in at windows of the houses you have built for poor and sick and hungry people and little lame and deaf and blind children. We have built our nests in the trees and sung many songs as we flew about the gardens and parks you have made so beautiful for your own children, especially your poor children, to play in.

Every year we fly a great way over the country, keeping all the time where the sun is bright and warm; and we know that whenever you do anything, other people all over the great land between the seas and the great lakes find it out, and pretty soon will try to do the same thing. We know; we know. We are Americans just as you are. Some of us, like some of you, come from across the great sea, but most of

the birds like us have lived here a long while; and birds like us welcomed your fathers when they came here many years ago. Our fathers and mothers have always done their best to please your fathers and mothers.

Now we have a sad story to tell you. Thoughtless or bad people are trying to destroy us. They kill us because our feathers are beautiful. Even pretty and sweet girls, who we should think would be our best friends, kill our brothers and children so that they may wear their plumage on their hats. Sometimes people kill us from mere wantonness. Cruel boys destroy our nests and steal our eggs and our young ones. People with guns and snares lie in wait to kill us, as if the place for a bird were not in the sky, alive, but in a shop window, or under a glass case. If this goes on much longer, all your song birds will be gone. Already, we are told, in some other countries that used to be full of birds, they are almost gone. Even the nightingales are being killed in Italy.

Now we humbly pray that you will stop all of this, and will save us from this sad fate. You have already made a law that no one shall kill a harmless song bird or destroy our nests or our eggs. Will you please to make another that no one shall wear our feathers, so that no one will kill us to get them? We want them all ourselves. Your pretty girls are pretty enough without them. We are told that it is as easy for you to do it as for Blackbird to whistle.

If you will, we know how to pay you a hundred times over. We will teach your children to keep themselves clean and neat. We will show them how to live together in peace and love, and to agree as we do in our nests. We will build pretty houses which you will like to see. We will play about your gardens and flower beds—ourselves like flowers on wings—without any cost to you. We will destroy the wicked insects and worms that spoil your cherries and currants and plums and apples and roses. We will give you our best songs and make the spring more beautiful and the summer sweeter to you. Every June Morning when you go out into the field, Oriole and Blackbird and Bobolink will fly after you and make the day more delightful to you; and when you go home tired at sundown, Vesper Sparrow will tell you how grateful we are. When you sit down on the porch after dark, Fife Bird and Hermit Thrush and Wood Thrush will sing to you and even Whip-poor-will will cheer up a little. We know where we are safe. In a little while all the birds will come to live in Massachusetts again and everybody who loves music will like to make a summer home with you.

ARBOR DAY SONGS.

Invocation.

(Air "America.")

We, children of the free,
Come here to plant this tree,
 With prayer and song;
A living sign to stand,
Of love to Fatherland,
 While years prolong.

In every flower and tree,
God's forming hand we see,
 And his great love,
And every bud and leaf
Increases our belief
 In heaven above.

Dear God of Nature, grant
This tree which now we plant
 May live and grow,
To bless with grace, with shade,
This loved and cherished glade,
 Our love to show.
—P. Harlow.

SONG OF DEDICATION.

Air—"Columbia, the Gem of the Ocean."

The tree we are planting on this day
Is chosen with tenderest care;
May beauty adorn it, hereafter,
 And clothe it with usefulness rare.
May green leaves appearing each springtime
Be leaves of a fair book of fame,
And spread to the breezes the story
Extolling the new-given name

The tree is an emblem of greatness,
As, springing from one tiny seed,
It mounts ever upward and onward,
 An emblem of greatness, indeed!
The birds sing its praises to others,
The winds carry swiftly the tale,
The tree is the monarch of forest,
Of hill, valley, greenwood and dale.

AFTER THE PLANTING.

(Tune—America.)

Grow thou and flourish well,
Ever the story tell .

Of this glad day.

Long may the tendrils raise
To heaven our grateful praise;
Waft them our sunlight ray
To God away.

Deep in the earth, today
Safely thy roots we lay,
Vine of our love.

Grow thou and flourish long,
Ever our grateful song
Shall its glad love prolong
To God above.

—Lydia Williams.

AN ANTHEM FOR ARBOR DAY.

(Tune—"America.")

Joy for the sturdy trees!
Fanned by each fragrant breeze,
Lovely they stand!

The song birds o'er them trill,
They shade each tinkling rill,
They crown each swelling hill,
Lowly or grand.

Plant them by stream or way,
Plant them where children play
And toilers rest;
In every verdant vale,
On every sunny vale,
Whether to grow or fail,—
God knoweth best.

God will His blessing send;
All things on Him depend;
His loving care
Clings to each leaf and flower
Like ivy to its tower;
His presence and His power
Are everywhere.

A FEW OPINIONS AS TO THE IMPORTANCE OF PRESERVING OUR NATIONAL RESOURCES.

The Great Commoner.

"It should be our purpose, not only to preserve the nation's resources for future generations by reducing waste to a minimum; we should see to it that a few of the people do not monopolize that which in equity is the property of all the people. The earth belongs to each generation, and it is as criminal to fetter future generations with perpetual franchises, making the multitude servants to a favored faction of the population, as it would be to impair, unnecessarily, the common store.

Money spent in care for the life and health of the people, in protecting the soil from erosion and from exhaustion, in preventing waste in the use of minerals of limited supply, in the reclamation of deserts and swamps, and in the preservation of forests still remaining and the planting of denuded tracts—money invested in these and in the development of waterways and in the deepening of harbors is an investment yielding an annual return. If any of these expenditures fail to bring a return at once the money expended is like a bequest to those who come after us. And as the parent lives for his child as well as for himself, so the good citizen provides for the future as well as for the present."

WILLIAM JENNINGS BRYAN.

The Ex-President of the United States.

"In utilizing and conserving the natural resources of the nation the one characteristic more essential than any other is foresight. Unfortunately, foresight is not usually characteristic of a young and vigorous people, and it is obviously not a marked characteristic of us in the United States. Yet assuredly it should be the growing nation with a future which takes the long look ahead; and no other nation is growing so rapidly as ours or has a future so full of promise. No other nation enjoys so wonderful a measure of present prosperity which can of right be treated as an earnest of future success, and in no other are the rewards of foresight so great, so certain, and so easily foretold. Yet hitherto as a nation we have tended to live with an eye single to the present, and have permitted the reckless waste and destruction of much of our natural wealth.

The conservation of our natural resources and their proper use constitute the fundamental problem which underlies almost every other problem of our national life. Unless we maintain an adequate material basis for our civilization, we can not maintain the institutions in which we take so great and just a pride; and to waste and destroy our natural resources means to undermine this material basis."

THEODORE ROOSEVELT.

The Governor of Idaho.

"We have built here a great nation, without a thought of to-morrow. We will grow still greater, even if we follow the same old methods that we have followed in the past. But we can not reach our full share of

greatness as a nation unless, before it is too late, we throw safeguards around those resources that have made us the mightiest nation on the earth, so that they can be preserved and protected, that they may be developed to the greatest extent for the benefit of this and future generations.”

GOODING.

The Governor of New Jersey.

“A lumber famine is dangerously near. Steep mountain sides are deforested for a few poor years of farming, and then abandoned, and their native fertility goes to choke the rivers and form bars in every harbor along the coast. The streams themselves become inactive and a large part of their power is wasted. The ills that come from this condition can be remedied by Government action alone, but that action must be taken now or we shall be staggered by the cost.”

STOKES.

The Governor of Massachusetts.

“Not merely the lumber supply, but water power and water supply are alike vitally connected with this movement, and no State can afford to ignore it.” * * *

GUILD.

The Governor of West Virginia.

“The matter is of such urgent importance that it can not be further delayed without great detriment to the best interest of the country.”

SWANSON.

The Governor of Connecticut.

“I believe that we of the present generation owe it to posterity to conserve our natural resources in this direction.”

WOODRUFF.

The Governor of Maryland.

“There is to my mind no waste of resources more appalling than the destruction of our forest wealth—wealth that came to us by inheritance with the soil.”

WARFIELD.

The Governor of Virginia.

“Not only are we wasting our forests, but most of our other natural resources as well. But forest preservation seems to be of first importance—indeed, it is a subject of pressing importance.”

DAWSON.

CLIPPINGS.

There is no spot on earth which may not be made more beautiful by the help of trees and flowers.—Holmes.

What earnest worker, with hand and brain, for the benefit of his fellowmen, could desire a more pleasing recognition of his usefulness than the monument of a tree, ever growing, every blooming, and ever bearing wholesome fruit?—Irving.

A man does not plant a tree for himself; he plants it for posterity: and sitting idly in the sunshine, I think at times of the unborn people who will to some extent be indebted to me. Remember me kindly, ye future men and women.—Alexander Smith.

What conqueror in any part of life's battle could desire a more beautiful, a more noble, or a more patriotic monument, than a tree planted by the hands of pure and joyous children, as a memorial to his achievements.—H. J. Lossing.

For many years I have felt a deep interest in the preservation of our forests and the planting of trees. The wealth, beauty, fertility, and healthfulness of the country largely depend upon it. My indignation is yearly aroused by the needless sacrifice of some noble oak or elm, and especially of the white pine, the grandest tree in our woods, which I would not exchange for the oriental palm. My thanks are due to the public school which is to plant a group of trees in your Eden Park in my honor.—John G. Whittier, to the school children of Cincinnati.

The man who builds does a work which begins to decay as soon as he is done, but the work of the man who plants trees grows better and better, year after year, for generations.

To own a bit of ground, to scratch it with a hoe, to plant seeds and watch their renewal of life—this is the commonest delight of the race, the most satisfactory thing one can do.—Charles Dudley Warner.

The best verses I have produced are the trees I have planted.—Holmes.

There is no unbelief,
Whoever plants a seed beneath the sod
And waits to see it push away the clod
Trusts in God.

—Bulwer-Lytton.

Our yards, our school house yards, and the resting places of our dead, should not be neglected, but should be adorned with nature's own beauties—the trees.—Emma F. Bates.

Do not rob or mar a tree, unless you really need what it has to give you. Let it stand and grow in virgin majesty, ungirdled and unscarred, while the trunk becomes a firm pillar of the forest temple, and the branches spread abroad a refuge of bright green leaves for the birds of the air.—Dr. Henry Van Dyke.

I can think of no more pleasant way of being remembered than by the planting of a tree. Birds will rest in it, and will fly thence with messages of good cheer. It will be growing while we are sleeping, and will survive us to make others happier.—Felix Oswald.

SCRIPTURE SELECTIONS.

I will plant in the wilderness the cedar tree, and the myrtle, and the oil tree I will set in the desert the fir tree, and the pine, and the box tree together.

He heweth him down cedars, and taketh the cypress and the oak, which he strengtheneth for himself among the trees of the forest; he planteth an ash, and the rain doth nourish it.

All the trees of the field shall clap their hands.

Instead of the thorn shall come up the fir tree, and instead of the brier shall come up the myrtle tree, and it shall be to the Lord for a name.

And the tree of the field shall yield her fruit, and the earth shall yield her increase, and they shall be safe in their land, and shall know that I am the Lord.

Mountains and all hills; fruitful trees and all cedars.

Let them praise the name of the Lord.

Then shall the trees of the wood sing out at the presence of the Lord.

The glory of Lebanon shall come unto thee, the fir tree the pine tree, and the box together.

That they might be called trees of righteousness, the planting of the Lord, that he might be glorified.

HISTORIC TREES.

(An exercise for seven pupils.)

I. Charter Oak.

In history we often see
The record of a noted tree.
We'll now some history pages turn
And note what trees we there discern;
And foremost of this famous band
We think the Charter Oak should stand.
We love to read the story o'er
How Andrus came from England's shore
As governor in this new land,
And ruled it with a tyrant's hand;
How, when he came to Hartford town
Demanding with a haughty frown
The charter of the people's rights,
All suddenly out went the lights;
And e'er again they re-appeared,
The charter to their hearts endeared
Lay safely in this hollow tree,
Guard of the people's liberty.
All honor, then, to Wadsworth's name,
Who gave the Charter Oak its fame.

II. Liberty Elm.

Another very famous tree
Was called the Elm of Liberty.
Beneath its shade the patriots bold
For tyranny their hatred told.
Upon its branches high and free
Were often hung in effigy
Such persons as the patriots thought
Opposed the freedom which they sought.

In war time, oft beneath this tree
The people prayed for victory;
And when at last the old tree fell
There sadly rang each Boston bell.

III. Washington Elm.

In Cambridge there is standing yet
A tree we never should forget;
For here, equipped with sword and gun,
There stood our honored Washington,
When of the little patriot band
For freedom's cause he took command.
Despite its age—three hundred years—
Its lofty head it still uprears;
Its mighty arms extending wide,
It stands our country's boasted pride.

IV. Burgoyne's Elm.

When, in spite of pride, pomp and boast,
Burgoyne surrendered with his host,
And then was brought to Albany
A prisoner of war to be,
In gratitude for his defeat,
That day, upon the city street,
An elm was planted, which they say
Still stands in memory of that day.

V. The Treaty Elm.

Within the Quaker City's realm,
There stood the famous Treaty Elm.
Here, with its sheltering boughs above,
Good William Penn, in peace and love,
The Indians met, and there agreed
Upon that treaty which we read
Was never broken, though no oath
Was taken—justice guiding both.
A monument now marks the ground.
Where once this honored tree was found.

VI. Tree From Napoleon's Grave.

Within a city of the dead,
Near Bunker Hill, just at the head
Of Cotton Mather's grave, there stands
A weeping willow which fond hands
Brought from Napoleon's grave, they say,
In St. Helena, far away.

VII. The Cary Tree.

I'll tell you of a sycamore
And how two poets' names it bore;
Upon Ohio's soil it stands,
'Twas placed there by the childish hands

Of sister poets, and is known
As Alice and Phoebe Cary's own.
One day, when little girls, they found
A sapling lying on the ground;
They planted it with tenderest care
Beside this pleasant highway, where
It grew and thrived and lived to be
To all around the Cary tree.

VIII. The Hamilton Trees.

In New York City proudly stand
Thirteen monarchs, lofty, grand,
Their branches tow'ring toward the sun
Are monuments of Hamilton,
Who planted them in pride that we
Had won our cause and liberty—
A tribute, history relates,
To the original thirteen States.

IX. Recitation by the School.

We reverence these famous trees.
What better monuments than these?
How fitting on each Arbor Day
That we a grateful tribute pay
To poet, statesman, author, friend,
To one whose deeds our hearts commend
As lovingly we plant a tree
Held sacred to his memory;
A fresh memorial, as each year
New life and buds and leaves appear—
A living monumental tree,
True type of immortality.

—Ada Simpson Sherwood.

PINES.

Like tall cathedral towers, these stately pines,
Uplift their fretted summits, tipped with cones,
The arch beneath them is not built with stones.
Not art, but nature traced these lovely lines,
And carved this graceful anabesque of vines;
No organ but the wind here sighs and moans,
No sepulchre conceals a martyr's bones,
No marble bishop on his tomb reclines.
Enter! the pavement, carpeted with leaves,
Gives back a softened echo to thy tread!
Listen! the choir is singing; all the birds,
In leafy galleries beneath the eaves,
Are singing! listen, ere the sound be fled.
And learn there may be worship without words.

—Longfellow.

THE BOY WHO NEVER SEES.

God help the boy who never sees
The butterflies, the birds, the bees,
Nor hears the music of the breeze
When zephyrs soft are blowing.
Who cannot in sweet comfort lie
Where clover blooms are thick and high,
And hear the gentle murmur nigh
Of brooklets softly flowing.

God help the boy who does not know
Where all the woodland berries grow,
Who never sees the forests glow
When leaves are red and yellow,
Whose childish feet can never stray.
For such a hapless boy I say
When Nature does her charms display—
God help the little fellow.

—Nixon Waterman.

“So great is the value of national forest area for recreation, and so certain is this value to increase with the growth of the country and the shrinkage of the wilderness, that even if the forest resources of wood and water were not to be required by the civilization of the future, many of the forests ought certainly to be preserved, in the interest of national health and well-being, for recreation use alone.”

Treadwell Cleveland, Jr.

THREE LITTLE TREES.

(Recitation for a tiny girl. Three other children stand near representing the trees—laughing, whispering, telling secrets, clapping hands, etc., in pretty pantomime to the speaker's words.)

Way out on the orchard in sunshine and breeze,
A-laughing and whispering, grew three little trees.

And one was a plum tree, and one was a pear,
And one was a rosy-cheeked apple tree rare.

A dear little secret, as sweet as could be,
The breeze told one day to the glad apple tree.

She rustled her little green leaves all about,
And smiled at the plum, and the secret was out.

The plum told in whispers the pear by the gate,
And she told it to me, so you see, it came straight.

The breeze told the apple, the apple the plum,
The plum told the pear, “Robin Redbreast has come!”

And out in the orchard they danced in the breeze,
And clapped their hands softly, these three little trees.

—Selected.

Nature is but a name for an effect
Whose cause is God.

—Cowper.

We may shut our eyes but we cannot help knowing
That skies are clear and grass is growing;
The breeze comes whispering in our ear,
That dandelions are blossoming near,
That maize has sprouted, that streams are flowing,
That the river is bluer than the sky,
That the robin is plastering his house hard by.

—Lowell.

There isn't a blossom under our feet
But has some teaching short and sweet
That is richly worth the knowing.
To me the meanest flower that blows can give
Thoughts that do often lie too deep for tears.

—Wordsworth.

BEFORE AND AFTER.

Last summer I went back to visit my boyhood home in Ohio, after an absence of thirty years. One of the most striking changes in the landscape was in the roofs of the buildings. They were nearly all of slate instead of shingles. A shingle roof was a sign that the house was a very old one. Even the chicken houses and barns and woodsheds were roofed with slate.

For why, wooden shingles had grown so high priced that slates could be brought from a distant state to compete with them; and the shingles were all made of such knotty, brash, inferior lumber that they rotted away in a short time and were not worth putting on.

Looking further, it was plain that in thirty years the state had changed from a country of wood to a country of clay. Bricks were the universal building material. Tiles were used where bricks were impossible or undesirable. Ceramics was the most important industry of the state. The lumber is gone! The wood is no more! The trees are gathered to their fathers!

I gazed in astonishment at a vast old oaken barn that had been in the scenes of my childhood; and talked with the gray-headed patriarch who owned it. Its sills were beams of solid oak, 24 and 26 inches square, 30 and 40 feet long, and there were scores of them. Away up, high above the tall haymows, were plates and beams by hundreds, all of sound old oak and each big enough for the foundation of a great building. The whole state now would be raked in vain to find the timber for that one barn. The lumber in it would be worth a huge sum now. But the old man told me it had all been cut from the choice trees of one field, right there—and I looked afar over a bare and treeless plain.

And all Ohio was one great, shaggy forest, only a hundred years

ago—dense forests of splendid hardwoods, walnut, hickory, oak, ash, maple, beech, sycamore, poplar. It was inexhaustible. The strong and hardy pioneers worked like slaves early and late to cut, burn, clear the land. They were sure the forests would last till the crack of doom.

Only a hundred years have passed; yet the country is bare; and every springtime now we read of the devastating floods of the Ohio; and the soil of the fertile farms continually goes to feed the yellow tides.

A RIDDLE.

I have only one foot, but thousands of toes;
My one foot stands, but never goes.
I have many arms, and they're mighty all;
And hundreds of fingers, large and small.
From the ends of my fingers my beauty grows.
I breathe with my hair, and I drink with my toes.
I grow bigger and bigger about the waist,
And yet I am always very tight laced.
None e'er saw me eat—I've no mouth to bite;
Yet I eat all day in the full sunlight.
In summer with song I shake and quiver,
But in winter I fast and groan and shiver.

—George McDonald.

WHY WE KEEP ARBOR DAY.

(For six children. As they take their places upon the stage, those in seats recite the first stanza.)

Trees of the fragrant forest,
With leaves of green unfurled,
Through summer's heat, through winter's cold,
What do you do for our world?

First—

Our green leaves catch the raindrops
That fall with soothing sound,
Then drop them slowly, slowly down,
'Tis better for the ground.

Second—

When rushing down the hillside,
A mighty freshet forms,
Our giant trunks and spreading roots
Defend our happy homes.

Third—

From burning heat in summer,
We offer cool retreat,
Protect the land in winter's storm
From cold, and wind, and sleet.

Fourth—

Our falling leaves in autumn,
By breezes turned and tossed,
Will make a deep sponge carpet warm
Which saves the ground from frost.

Fifth—

We give you pulp for paper,
Our fuel gives you heat,
We furnish lumber for your homes,
And nuts and fruit to eat.

Sixth—

With strong and graceful outline,
With branches green and bare,
We fill the land through all the year
With beauty everywhere.

All—

So, listen, from the forest,
Each one a message sends
To children on this Arbor Day,
“We trees are your best friends.”

—Primary Education.

FOR SEVEN LITTLE FOLKS.

(Each one is to carry the flower or plant of which he speaks.)

Little Baby Violet,
On her mother's lap,
In her pretty dress of green,
And her wee blue cap;
Laughing at the sunshine,
Nodding to the bee,—
Cunning little violet,
Who so sweet as she?

The wind goes calling through the grass
“Come Kitty, Kitty Clover!”
“Dear Wind,” purrs Kitty, drowsily,
“Oh say is winter over?”
“Yes, yes,” the laughing wind replies,
“It is the month of May;
And Buttercup and Violet
Are dressed for Arbor Day.”
Then up springs Clover from her nap,
And dons her coat of pink,
The very prettiest kitty,
Of all the kits, I think.

Look at Boy Buttercup,
Gay little fellow,
Out in the meadow grass,
Dressed all in yellow;
When the bright sunbeams peep
Through the sky's blue,
"Ho!" cries Boy Buttercup,
"I'm golden as you."

There's an odd little boy that I've often seen,
He's always dressed in a coat of green,
With a flapping hat pulled over his face
To keep off the heat of the sun's bright rays.
He's an awfully quiet sort of a chap,
And I think he's generally taking a nap,
For never a single word will he say,
Though I speak to him twenty times a day.
What is his name? Just bend your ear,
It's "Jack-in-the-Pulpit"—isn't that queer?

The daisy's throne is emerald green,
Her robe is ermine white
And on her pretty head she wears
A crown all golden bright.
The sunbeams, dew, and breezes soft
Are courtiers, blithe and gay,
And the meadow is the kingdom
Of this fair queen of May.

My big, big brother said to me
"There's a lion 'way down there."
He thought, 'cause I am only six,
I'd get an awful scare;
I wasn't 'fraid a single bit,
But on to school kept going,
And 'way, 'way down the road I found
A dandelion growing.

Captain Grass Blade now is seen,
In his uniform of green,
Followed by his soldiers true,
Marching woods and meadows through;
On, and ever on, they go,
Stopping not for friend or foe,
And they will not halt until
Winter bids them all stand still.

—Virginia Baker, Primary Plans.

(Teachers with a little ingenuity may substitute other flowers than those mentioned above if those flowers are not obtainable.)

RECITATION.

(For Six Children.)

First—

Pussy willow heard the robin
Singing in the trees,
And she came in furry garments,
Rustling in the breeze.
Pussy willow said: "Come, look,
Daisies nod beside the brook!"
Pussy willow's come to stay,
Pussy in her hood of gray!

Second—

The maple heard the robin sing,
And said: "Without a doubt
Arbor Day has come again,
My leaves I must put out!"
All the little maple leaves
Heard the robin's call,
Robin Redbreast sang to them:
"Come out, one and all!"

Third—

The lilacs heard the robin sing,
They said: "We know, we know,
What Robin Redbreast sings about,
He says: 'Tis time to grow,
The air is warm on this spring day,
And, oh, the sun is bright,
'Tis time that little lilac buds
All should seek the light!"

Fourth—

The violets heard the robin, too,
And they opened eyes of blue,
"In this pleasant, mossy bed,
We will bloom," the violets said,
So they sent up leaves of green,
Little flowers peeped between;
They said: "We heard the robin sing,
So we've come to greet the spring!"

Fifth—

Little crocus heard a tapping,
Could it be a wood-pecker rapping?
Robin Redbreast sang, "I'm here,
'Tis time to wake up, crocus, dear!"
Crocus said: "Without a doubt
Pussy Willow has come out!"
Then crocus raised her pretty head,
"Robin Redbreast's come," she said.

Sixth—

The children heard the robin's song,
And they began to sing.
All the birds will soon be here,
For it is pleasant spring!
Robin Dear and bluebird,
Meadow lark and wren,
Are singing in the woodland
For spring has come again!

All—

The apple blossoms are in bloom,
And all the world is fair,
The meadow lands are full of flowers,
Green grass grows everywhere!
"Tinkle, tinkle," sings the stream,
"I'm never tired of play,
But won't you come and plant a tree,
On happy Arbor Day?"

The year's at the spring,
The day's at the morn,
The morn's at seven,
The hill-side's dew-pearled,
The lark's on the wing,
The sail's on the thorn,
God's in his heaven,
All's right with the world.

—Browning.

And Nature, the old nurse, took
The child upon her knee,
Saying: "Here is a story book
Thy Father has written for thee."
"Come wander with me," she said,
"Into regions yet untrod;
And read what is still unread
In the manuscripts of God."

—Longfellow.

They'll come again to the apple tree—

Robin and all the rest—
When the orchard branches are fair to see,
In the snow of blossoms dressed.
And the prettiest thing in the world will be
The building of the nest.

—Mrs. M. E. Sangster.

Sweet bird; thy bower is ever green,
Thy sky is ever clear;
Thou hast no sorrow in thy song.
No winter in thy year.

—John Logan.

Winged lute that we call a bluebird, you blend in a silver strain
The sound of the laughing water, the platter of spring's sweet rain,
The voice of the winds, the sunshine, the fragrance of blossoming things,
Oh, you are an April poem, that God has dowered with wings.

—E. E. Rexford.

Crocus heard a tapping, tapping,
As of some one gently rapping,
And she raised her head to see
Who her visitor might be
Robin stood there singing, singing,
Of the joys the hours where bringing,
Crocus called to him "Good day,"
Said she hoped he'd come to stay.
Overhead a drumming, drumming,
Said that spring was surely coming,
So Crocus cried, "Come, birdies, for
You'll find me waiting by my door."

—Primary Teacher.

If thou art worn and hard beset,
If thou wouldst read a lesson that will keep
Thy heart from fainting and thy soul from sleep,
Go to woods and hills! No tears
Dim the sweet look that Nature wears.

—"Sunrise on the Hill."—Longfellow.

The rose is fairest when 'tis budding new,
And hope is grimest when it dawns from fears;
The rose is sweetest wash'd with morning dew,
And loveliest when embalm'd in tears.

—Scott.

In freedom's air we plant the tree,
Our land of hope, America;
Beneath the blue sky, freedom's dome,
Within the green earth, freedom's home,
We plant the tree for years to come,
And pray, God bless America.

—Hezekiah Butterworth.

In the door-yard fronting an old farm-house, near the white-washed
palings,
Stands the lilac-bush tall-growing with heart-shaped leaves of rich green.
With many a pointed blossom rising delicate, with the perfume strong
I love
With every leaf a miracle.

—Walt Whitman.

In all places, then, and in all seasons,
Flowers expand their light and soul-like wings,
Teaching us, by most persuasive reasons,
How akin they are to human beings.
—Longfellow.

Where I, O God, in churchless lands remaining,
Far from all voice of teachers or divines,
My soul would find in flowers of thy ordaining
Priests, sermons, shrines.
—Horace Smith.

Teach me half the gladness
That my brain must know,
Such harmonious madness
From my lips would flow,
The world would listen then
As I am listening now.
—Shelley.

O thrush, your song is passing sweet,
But never a song that you have sung
Is half as sweet as thrushes sang
When my dear love and I were young.
—Wm. Morris.

Now rings the woodland loud and long,
The distance takes a lovelier hue,
And drowned in yonder living blue
The lark becomes a sightless song.
—Tennyson—In Memoriam.

MEMORY GEMS.

Summer or winter, day or night,
The woods are ever a new delight.
—Stoddard.

There's nothing the eye of the gazer sees
More worthy of love than the beautiful trees.
—Selected.

Let us plant a tree by the wayside,
Plant it with smiles and with tears;
A shade for some weary wanderer,
A hope for the coming years.
—L. M. Mooney.

Come, sit down, little children,
Beneath these tall old trees,
There's such a world of sweetness
In the kisses of the breeze.
—Alice Cary.

A traveler on a dusty road
Threw acorns on the lea,
And one took root and sprouted up,
And grew into a tree.
The children loved its pleasant shade
The birds sweet music bore;
It stood a glory in its place,
A blessing evermore.
—Selected.

The breeze, like music, wanders o'er the boughs,
Each tree a natural harp—each different leaf
A different note blent in one vast thanksgiving.
—Landon.

And God said, "Let the earth bring forth the fruit tree yielding fruit after its kind;" and God saw that it was good.—Bible.
A large branching, aged oak is perhaps the most venerable of all inanimate objects.—Shenstone.

Trees the most lovingly shelter and shade us when like the willow,
the higher soar their summits the lowlier droop their boughs.—Bulwer Lytton.

Mouldering and moss-grown, through the lapse of years, in motionless beauty stands the giant oak; whilst those who saw its green and flourishing youth are gone and are forgotten.—Henry Wadsworth Longfellow.

O, mickle is the powerful grace that lies
In herbs, plants, stones, and their true qualities;
For naught so vile that on the earth doth live,
But to the earth some special good doth give.
—William Shakespeare.

I listened to the birds and frequently turned out of my path, lest I should disturb their little songs or frighten them to another station.—Robert Burns.

This learned I from the shadow of a tree
That to and fro did sway upon a wall:
Our shadow stretches, out influence may fall
Where we can never be.

—A. E. Hamilton.

Go, make thy garden fair as thou canst,
Thou workest never alone;
Perchance he whose past is next to thine
Will see it, and mend his own.

—Robert Collyer.

Grow as the trees grow,
Your head lifted straight to the sky,
Your roots holding fast where they lie,
In the richness below;
Your branches outspread
To the sun pouring down, and the dew
With the glorious infinite blue
Stretching over your head.

—Selected.

BIRD DAY.

Don't kill the birds, the happy birds,
That bless the fields and grove;
So innocent to look upon,
They claim our warmest love.

—Colesworthy.

Four blue eggs. all in the moss,
Soft-lined home on the cherry bough,
Ah! Life is trouble, and love is loss,
There's only one robin now.

—Thomas Bailey Aldrich.

The wind blows east, the wind blows west;
The blue eggs in the robin's nest
Will soon have wings and beak and breast,
And flutter and fly away.

—Henry Wadsworth Longfellow.

How pleasant the life of a bird must be,
Flitting above in each leafy tree;
In the leafy trees so broad and tall.
Like a green and beautiful palace hall,
With its airy chambers, light and boon,
That open to sun and stars and moon;
That open to the bright blue sky,
And the frolicsome winds as they wander by!

--Mrs. Hemans.

The little bird sits at his door in the sun
Atilt like a blossom among the leaves,
And lets his illumined being o'errun
With the deluge of summer it receives;
His mate feels the eggs beneath her wings
And the heart in her dumb breast flutters and sings.
—James Russell Lowell.

HISTORIC TREES.

I do not wonder that the great earls value their trees, and never, save in the direst extremity, lift upon them the axe. Ancient descent and glory are made audible in the proud murmur of immemorial woods. There are forests in England whose leafy noises may be shaped into Agincourt, and the names of the battlefields of the Roses; oaks that dropped their acorns in the year that Henry VIII held his Field of the Cloth of Gold, and beeches that gave shelter to the deer when Shakespeare was a boy. There they stand in sun and shower, the broad-armed witnesses of perished centuries; and sore must his need be who commands a woodland massacre. A great tree, the rings of a century in its boll, is one of the noblest of natural objects; and it touches the imagination no less than the eye, for it grows out of tradition and a past order of things, and is pathetic with the suggestions of dead generations. Trees waving a colony of rooks in the wind today are older than historic lines. Trees are your best antiques. There are cedars on Lebanon which the axes of Solomon spared, they say, when he was busy with his Temple; there are olives on Olivet that might have rustled in the ears of the Master of the Twelve; there are oaks in Sherwood which have tingled to the horn of Robin Hood, and have listened to Maid Marian's laugh. Think of an existing Syrian cedar which is nearly as old as history, which was middle-aged before the wolf suckled Romulus; think of an existing English elm in whose branches the heron was reared which the hawks of Saxon Harold killed! If you are a notable, and wish to be remembered, better plant a tree than build a city or strike a medal—it will outlast both.—Alexander Smith.

PINE TREES.

The pine is trained to need nothing and to endure everything. Tall or short, it will be straight. Small or large, it will be round. It may be permitted to the soft lowland trees that they should make themselves gay with the show of blossom; and glad with the pretty charities of fruitfulness. We builders with the sword have harder work to do for man, and must do it in close-set troops.

To stay the sliding of the mountain snows, which would bury him; to hold in divided drops, at our sword points, the rain, which would sweep away him and his treasure fields; to nurse in shade among our brown, fallen leaves the tricklings that feed the brooks in drought; to give massive shield against the winter wind, which shrieks through

the bare branches of the plain—such service must we do him steadfastly while we live.

Our bodies also are at his service—softer than the bodies of other trees, though our service is harder than theirs. Let him take them as he pleases for his houses and ships. So also it may be well for these timid, lowland trees to tremble with all their leaves, or turn their paleness to the sky, if but a rush of rain passes by them; or to let fall their leaves at last, sick and sere. But we pines must live amidst the wrath of clouds. We only wave our branches to and fro when the storm pleads with us, as men toss their arms in a dream.

—John Ruskin.

“Thou tall, majestic monarch of the wood,
That standest where no wild vines dare to creep—
Men call thee old, and say that thou hast stood
A century upon my rugged steep;
Yet unto me thy life is but a day,
When I recall the things that I have seen—
The mountain monarchs that have passed away
Upon the spot where first I saw thy green;
For I am older than age of man,
Of all the living things that crawl or creep,
Or birds of air, or creatures of the deep;
I was the first dim outline of God's plan.
Only the waters of the restless sea
And the infinite stars in heaven are old to me.”

USES OF THE FOREST.

About 60 per cent. of all our railroad ties are made of white oak; nearly 20 per cent. are pine. Since every mile of railway needs about twenty-five hundred ties, and there are over two hundred thousand miles of such roads in our country, it takes millions of acres of timber to supply a single set of ties. Such a set has to be replaced about every seven years. Thus it is that the railways rank among the greatest consumers of wood in the country.

Our telegraph and telephone poles are made largely from hemlock and cedar. The price paid for such timber varies from two to ten dollars per pole.

Flour barrels are made largely from elm. Barrels for liquids from a fine grade of white oak; also ash and elm.

Our furniture is made from walnut, ash, oak, maple and other hard woods.

White oak and hickory are used in manufacture of wagon and buggy wheels.

Soft woods, as poplar, aspen, spruce, pine and basswood, are used in the manufacture of paper such as is used in newspapers, note books, etc.

Three-fourths of our lumber is made from soft woods, such as white pine, spruce, hemlock and redwood.

The woodwork of machinery is made from hard wood lumber, which constitutes about one-fourth of our lumber output. It comes principally from the wide region east of the Mississippi, between the northern and southern soft wood belts.

The great pineries of Wisconsin, Minnesota and Michigan supply our white pine, the most useful timber in the north temperate zone, because it is in greatest demand for building purposes.

The bark of the hemlock tree is used in the tanning of leather.

Corks are made from the bark of the cork oak, which grows only in Mediterranean countries and Portugal.

As a national industry, forestry stands second only to agriculture in number of people and amount of capital employed and in value of product.

It has been estimated that we have five hundred million acres of growing forest, and that 35 cubic feet of wood are produced annually per acre.

OUR TIMBER SUPPLY.

By Gifford Pinchot, Chief of the Forest Service of the United States.

The lowest estimate reached by the Forest Service of the timber now standing in the United States is 1,400,000,000,000 feet, board measure; the highest 2,000,000,000,000. The present annual consumption is approximately 100,000,000,000 feet, while the annual growth is but a third of the consumption, of from 30,000,000,000 to 40,000,000,000 feet. If we accept the larger estimate of the standing timber, 2,000,000,000,000 feet, and the larger estimate of the annual growth, 40,000,000,000 feet, and apply the present rate of consumption, the result shows a probable duration of our supplies of timber of not more than thirty-three years.

Estimates of this kind are almost inevitably misleading. For example, it is certain that the rate of consumption of timber will increase enormously in the future, as it has in the past, so long as supplies remain to draw upon. Exact knowledge of many other factors is needed before closely accurate results can be obtained. The figures cited are, however, sufficiently reliable to make it certain that the United States has already crossed the verge of a timber famine so severe that its blighting effects will be felt in every household in the land. The rise in the price of lumber which marks the opening of the present century is the beginning of a vastly greater and more rapid rise which is to come. We must necessarily begin to suffer from the scarcity of timber long before our supplies are completely exhausted. It is well to remember that there is no foreign source from which we can draw cheap and abundant supplies of timber to meet a demand per capita so large as to be without parallel in the world, and that the suffering which will result from the progressive failure of our timber was but faintly foreshadowed by the recent temporary scarcity of coal.

What will happen when the forests fail? In the first place, the business of lumbering will disappear. It is now the fourth greatest industry in the United States. All forms of building industries will suffer with it, and the occupants of houses, offices, and stores must

pay the added cost. Mining will become vastly more expensive; and with the rise in the cost of mining there must follow a corresponding rise in the price of coal, iron, and other minerals. The railways, which have as yet failed entirely to develop a satisfactory substitute for the wooden tie (and must, in the opinion of their best engineers, continue to fail), will be profoundly affected, and the cost of transportation will suffer a corresponding increase. Water power for lighting, manufacturing, and transportation, and the movement of freight and passengers by inland waterways, will be affected still more directly than the steam railways. The cultivation of the soil, with or without irrigation, will be hampered by the increased cost of agricultural tools, fencing, and the wood needed for other purposes about a farm. Irrigated agriculture will suffer most of all, for the destruction of the forests means the loss of the waters as surely as night follows day. With the rise in the cost of producing food, the cost of food itself will rise. Commerce in general will necessarily be affected by the difficulties of the primary industries upon which it depends. In a word, when the forests fail, the daily life of the average citizen will inevitably feel the pinch on every side. And the forests have already begun to fail, as the direct result of the suicidal policy of forest destruction which the people of the United States have allowed themselves to pursue.

SUBJECTS FOR COMPOSITIONS.

1. The Native Forest Trees of Our Country.
2. A Few Plants Most Useful to Man.
3. Ways of Using the Forests Without Destroying Them.
4. Why Children Should Be Interested in Arbor and Bird Day.
5. What I Planted in My Garden.
6. Home Gardens.
7. School Gardens.
8. How to Make Bird Houses.
9. Nesting Boxes.
10. Birds and Insect-Destroyers.
11. Bird Nests.
12. Bird Ways.
13. Bird Legends.
14. The Wild Flowers of Our District.
15. Flower Legends.
16. My Favorite Tree.
17. Legends About Trees.
18. What the Trees Do for Us.
19. What do you know or what can you learn about each of the following trees:

The Freedman's Oak.

The Cambridge Elm.

The Treaty Elm.

The Big Trees of California.

The Charter Oak.

The Apple Tree of Appomatox.

The Liberty Elm.

The Baobab Tree of the Cape Verde Islands.

The Banyan Tree of India.

THE FOREST RANGER.

By E. R. Jackson.

The ranger secures his position by competitive examination under the Civil Service. Local residents are given preference in these examinations, in order to make sure that only men who are familiar with local conditions are employed. The tests are both written and by demonstration. Practical questions only are given and while experience is more desirable than mere book learning, yet the ranger must have sufficient education to be able to make maps and write intelligible reports upon forest business. It is also desirable that he know something about the elements of surveying, timber estimating and forest regulations. It is above all essential, however, that he know how to care for himself and his horses when far away from settlements. It is said that one candidate in reply to a question as to what provision he would take with him for a three weeks' trip into the mountains in August began his list with twenty pounds of beef, which would probably spoil the second day out. Another, endeavoring to be thoughtful of his horse's welfare, listed 50 pounds of horse feed—when grass is never more succulent or easily found than in the mountain meadows in midsummer. But perhaps the demonstration tests are more important, and here is where our old friends, the cowboys, shine particularly bright, though they may be short indeed on book knowledge. The diamond hitch, the pack, the camp fire or the rifle have no terrors for these men who grow nervous at the feel of the penholder between their fingers. And in the end, the ranger must know more about horses and the wilderness than about books, if he is to be successful. He must show himself to be able-bodied, capable of enduring hard work and even privations. As the "Use Book" perhaps somewhat ironically says, "Invalids seeking light out-of-doors employment need not apply."

If the candidate is successful in passing the examination, he is given a six-months try-out as assistant forest ranger, and if he makes good, and is recommended by the supervisor at the end of this probationary period, he becomes a full-fledged ranger at a salary of \$1,100 a year. The ranger provides his own outfit—horse, saddle and personal equipment. He is now ready to begin his job. He reports to the Supervisor of the Forest to which he is assigned and is given a regular district to patrol. The 152 national forests, which are located almost exclusively in the West, include a total area of nearly 200 million acres. The average area per ranger is 104,000 acres or approximately 168 square miles. This is necessary because of insufficient funds to provide rangers to make possible a more efficient patrol.

The ranger's work lies almost entirely within the national forests. Seldom may he leave his territory, especially during the dry season when there is danger of fire. There he lives and works, seldom even taking his 15 days annual leave of absence.

It is the policy of the Government to provide the rangers with houses as fast as funds will allow. Many ranger stations have already been built where the ranger may live with his family, if he has a family. But sometimes, when no cabin has been provided, the ranger must

build one himself. One ranger has taken advantage of a hollow Big Tree log and within it constructed his cabin. Others provide for themselves substantial cabins, where they may live comfortably in spite of storms and rains and winter snows.

Probably the first duty assigned to the new ranger is to make a trip over "his beat." So he packs his blankets, cooking utensils, shelter tent and other necessary equipment on a patient pack horse, mounts his saddle horse and rides away, to be gone perhaps a week, perhaps a month. Sometimes he goes alone, though occasionally some tourist will be his companion, or frequently in summer, technical assistants may go with him part of the time to make scientific studies in the forest.

The route of the ranger frequently leads him through scenery that is kaleidoscopic in its variation and beauty. His pathway often runs from the lowest gates of some vast canyon, through mountain meadows carpeted with aromatic blossoms that lift bright, communicative faces to greet the solitary passer-by, up along some mountain trail where beetling walls overhang on one side and a sheer precipice threatens on the other, until the uppermost limits of the forest are reached amid the snow-clad summits. Perhaps he may even ascend far above the clouds that hang about the lifted heads of the highest mountains and look out upon a billowy sea of mist illumined by the rays of the sun.

Sometimes the ranger allows his faithful horse to rest and skirts the shores of an Alpine Lake in boat or canoe. One ranger, in Montana, lives almost continually in his canoe, patrolling the shores of a large lake. In winter, the snow may be so deep that travel is impossible except by means of snowshoes and sledge.

But there is more for the ranger to do on his patrol trip than merely ride gaily through the greenwood like some knight of "merrier old England;" invariably he carries with him a hammer and a number of cloth-signs warning campers against the danger of allowing their fires to get away from them.

If a sale of timber is contemplated, the ranger must mark the trees that may be cut, taking care to provide for thinning when necessary; for the removal of dying or mature trees where the stand needs to be replaced by young growth; and to get rid of defective trees as much as possible so as to provide room for the better young stand beneath them. If there has been a timber sale, he must see that the debris and brush is cleared up and properly piled so as to prevent the spread of possible fires. And when a still day comes, the brush thus piled is burned, so that it no longer is a menace to the forest. This is often done when snow is on the ground to insure greater safety, since then practically all danger of fire spreading is obviated.

Another task which requires great tact and much practical knowledge on the part of the ranger is the examination of claims of settlers within the national forest. If there are lands suited to agricultural purposes within the forests, they may be taken and cultivated just as other lands outside the forest. But, of course, many proposed claims are established, under the allegation of utilizing them for agriculture, when really the purpose is to secure the timber from them. These claims are, of course, rejected in the ranger's report to the supervisor.

This perhaps explains why some of the western papers are filled with statements that the ranger is a stumbling block in the path of the western country toward progress and development.

Other users of the forests also come under the supervision of the ranger. Thousands of sheep graze within the forest ranges, but each owner must keep to his assigned territory and not run on a number of animals beyond that allowed in his permit. Cattle, too, are grazed under permit, and the old time war between sheep men and cattle men has been made impossible because the range is divided between them.

Many of the states in which the national forests are located have game laws, and the rangers are made game wardens to enforce these laws. Thus they are given police power to make arrests for illegal killing of game. On the other hand, one of their duties is to kill predatory animals, such as bears, coyotes and bobcats, which prey upon the sheep and other animals of the range. Special assistants are sometimes hired whose sole duty it is to hunt and trap these dangerous animals.

Thus the ranger lives and labors for weeks at a time, pitching his camp at night amid the fragrant pines and spruce trees. Each morning he is early astir, ready for a new day. And after weeks of travel, much of the time alone, he finally emerges from the forest, bronzed and bearded, but ready for whatever has turned up during his absence from headquarters.

But the ranger's life does not consist, as one disappointed novice put it, of merely "riding around under the trees and making outsiders toe the mark." There is hard manual labor to be done. There are stumps to be grubbed out to clear ground for nursery sites and ranger stations; routes for trails must be surveyed, not always over level land at that; and often this must be done in winter, in spite of cold and snow. Much heavy work is sometimes necessary to clear off these trails, which are absolutely necessary in order to make possible rapid travel in the forest in case of fire. The trails are sometimes actually cut from the mountain side.

Then there are bridges to be built across streams if these trails are to be worth anything and access given to valuable timber. These bridges are often temporary only, but some times more pretentious structures are erected. These trails and bridges form very valuable permanent improvements, and have added greatly to the value of the property in the national forests, not only by making accessible otherwise inaccessible places, but by reason of the increased facility with which fires may be reached and extinguished. By means of them, also, the sheep and cattle on the forest ranges are enabled to cross dangerous streams in safety.

Another form of permanent improvement in the national forests is the telephone lines that are being installed. They enable the ranger to get quickly into communication with the Supervisor's office if he needs help to fight fire, thus saving many a hard ride. The wires are often strung on the tree trunks, but where no suitable trees are available

poles are set. Perhaps nothing has ever been done that renders a more efficient service in prevention of fires than this.

The forest fire furnishes the most strenuous and the most exciting part of the work of the forest ranger. During the hot, dry summer season, he must be constantly on the watch for this, his arch enemy. Perhaps some still, hot day in Indian Summer, his route carries him to some high point where he can overlook a vast stretch of forest. As he pauses at the highest peak his quick eye detects what at first seems to be a thin rift of cloud far along the side of the mountains. He leaves his horse and clambors to a higher vantage point where he brings his field glass into play, for he must make sure whether this is smoke or mist. Should he misjudge, the consequences might be untold damage on one hand or a long, hard, useless ride on the other. When at last he has satisfied himself that the enemy is really at hand, he hesitates no longer. If he thinks he can cope with the situation alone he proceeds post haste to the site of the fire, and perhaps he may succeed in beating it out with his saddle blanket. Such fires are scarcely deemed worthy of mention in the ranger's diary and report.

But frequently it is not such an easy task, but one in which the ranger requires aid. If a telephone line is close by he calls the supervisor or the nearest ranger station for help, stating the location and extent of the fire. It has been said that the rangers constitute the greatest fire department in the world. But the ranger's equipment consists of no polished engines or towering ladder—it is often nothing more than a mustang pony and a pine bough or his saddle blanket. If the fire is a grass or surface fire in or near the forest, it has been found by experience that it can be fought effectively with the aid of common garden sprinklers, followed by a boating with wet sacks or blankets; shovels, axes, and heavy hose are necessary to combat the fiercer crown fires. A plan is now being adopted of placing boxes of tools such as these at convenient places ready for use when a fire breaks out. Armed with these tools, the fire fighters hasten to the fire and endeavor to check it before it grows too formidable, by cutting a lane or guard in front of its path across which it cannot leap. Sometimes backfiring is necessary, and then the ranger fights fire with fire, so that the two fires meet and die out for want of fuel. The common plan is to dig and scrape trenches around the fire, forcing it to a narrower and narrower front, and taking advantage of streams, trails, slopes, and other topographical features that may assist in checking the onrush of the flames. Not always are the fire fighters successful in checking the flames, but the men of the Forest Service have a remarkable record of efficiency in this respect. The Report of the Forester for 1910, contains the statement that of 3,138 fires reported, 2464 were extinguished by the rangers alone, without additional expense or aid.

A forest fire is a terrible menace. The lives of the rangers are constantly threatened and work under more trying circumstances can hardly be imagined. In the great fires of the Northwest last year, there were revealed heroes who need not blush in the presence of any

battle-tried veteran of history. The story of Ranger Pulaski is typical.

Edward C. Pulaski, of Wallace, Idaho, was the ranger in charge of a gang of 40 fire fighters. When they found that the fire had gotten beyond their control Pulaski started to lead them to a place of safety, placing them in single file, himself in the lead. They had not gone far before they seemed to be surrounded by fire. The men grew panicky. Pulaski, himself, says that he saw columns of clear white flame spring up like will-o'-the-wisps, feeding on nothing but air. The smoke was so dense that the men had to hold one another to keep from getting lost. Their leader halted the apparently doomed men, soaked a gunny sack with water and dashed off through the fire and smoke to look for a way of escape. The men gave up hope, convinced that he would never return. But he did return and finally led them to an abandoned mine tunnel into which he ordered them. It seemed like condemning the men to immediate suffocation. The mine timbers were on fire, and the tunnel was filled with smoke. Pulaski stood at the mouth of the tunnel, with drawn revolver and held the men back. In the gang of 40, there were but few Americans. These helped Pulaski control the others, most of whom before long were lying on the ground gasping for breath, crying and praying. In five hours, the cave became a mad house. Now and then tortured men would rush upon the indomitable ranger, trying to get past him to the open, only to be hurled back and grimly ordered to lie down with faces close to the ground. That he was able to stand and fight men within and fire without for as long as he did is a miracle and sets a new standard for American hardihood. At first it was thought that Ranger Pulaski would lose his sight, but prompt treatment in a hospital saved his eyes. Pulaski is a great-grandson of Count Pulaski, the polish exile of Revolutionary fame. He is the oldest male in direct line of descent and inheritor of the title of count—but Pulaski, American forest ranger, does not care for that sort of thing.

Through the efforts of such men as Pulaski, the people of the United States are saved each year thousands of acres of valuable timber land that otherwise would be fire swept and worthless. But before fires can be altogether prevented, larger forces of rangers must be provided, and much work done in preparing permanent systems of fire protection. The bleached and deadened tree trunks which cover many a western mountain side are mute witnesses of the tardiness of our Government in giving needed protection to its forests.

THE STORY OF THE AMBITIOUS TREE.

By E. F. Allen, Forester for the Western Forestry Association.

This story begins nearly three hundred years ago. There was no United States then. At Jamestown in Virginia and Plymouth in Massachusetts little bands of settlers had just left their ships and began with their axes to clear a foot-hold on the shores of a new world. From their little clearings westward to the Pacific ocean was only wilderness unknown to white man. It had never occurred to anyone to wonder

what lay where our own state of Washington was built up so long after—even to wonder whether it was land or sea.

One late fall day in that long ago time our mountains and valleys of Washington, looking exactly as they do now, lay bathed in the same Indian summer sunlight all of us have seen so often. The sky was blue and a warm wind rustled all the trees. As the topmost branches of an old fir on a ridge-top swayed lazily, a tiny fir seed fluttered from them and drifted gently toward the valley below. It bore a little wing that caught the breeze, so instead of falling at once it whirled and fluttered, like a bit of tissue paper, far above the tree-tops as though it never expected to reach the ground.

Probably it was in no hurry, for all summer long it had been shut up tight and dark in the ripening fir cone. Even for some time after it was ripe the cone would not open, for it was waiting for just such a drying wind which would not only curl its scales apart and release all the little seeds inside, but would also carry them as far as possible on their delicate wings. So the fir seed was very glad to make its freedom last and it raced and tumbled in the air with thousands of other little seeds, for all the trees on the ridge-top had felt the same message in the warm fall afternoon and one by one their cones had opened and freed the imprisoned seeds.

One of the first acquaintances the fir seed made was a fat little pine seed and they drifted close together for awhile, but the pine seed was too heavy to keep up the chase and gave up just as they were above the foot of the ridge.

"Good bye," called the fir seed, "I am going out into the valley."

The pine seed could not answer, for it was falling fast in the shelter of the hill, but an old pine tree it touched in passing said: "Never mind. We may be too heavy to fly well, but we have our strong points. I've heard that some of us grow where it is too dry for the fir family and if that young fellow goes too far he may be sorry."

The fir seed and his brothers danced on out over the valley, but after all they had very little to say about where they were going and, just as they were looking ahead for an attractive place to land, the breeze died and they fell almost as quickly as the pine seed had fallen. The fir seed landed in an opening made by fire which must have been started by lightning or by Indians, for you will remember that all this happened three hundred years ago. It was not just what he had expected when the journey began, but he did not mind so much because dark was near anyway and very few seeds care to fly in the damp night air. He went to sleep in the ashes and, curiously enough, when morning came, he had lost all interest in flying and found plenty to occupy his mind in hiding from birds and mice that like nothing better than seeds of any kind.

Soon the rains fell, and then snow lay deep on the ground, so the fir seed saw little more of life till spring came. But one who has flown through the air on wings can never again be content to lie quiet in the dark. Already ambition stirred in his heart and all winter long he dreamed of a time when he should do something fine and useful. He did not know what exactly, but was sure it would be very grand and

well worth waiting for. And at last, when the spring came and warmed the earth, he felt that the time to begin had come and his heart swelled more and more with ambition until his shell burst and six tiny grass-like leaves pushed through the ashes together and opened like fingers. One would not have guessed that they were even related to the big firs with firm pointed needles. But these soon fell away and the little fir tree began to shoot up, looking for light. Near him were his brothers, who had joined in the flight from the ridge-top, and also many plants the fir tree had never heard of.

They all grew and struggled and pushed, each trying to get above the others so as to get all the light. At first the ferns, or brakes, threatened to get the best of it, but in three or four years the little fir and his brothers were as large as small Christmas trees and quite able to hold their own. They began to fight each other and the later arrivals that had flown from the ridge a year or two after they did and settled in between them. And the young fir fought hardest of all, for all the while he knew that some day he would be called to do something glorious. When his weaker brothers grew tired and lagged behind, he only held his head higher. When the fall storms tried to blow him down, his roots struck into the earth all the deeper, and when the winter snows bent his branches down he bore it bravely and was proud of his strength.

This fighting was the history of the fir trees for nearly a hundred years. He had little time to think of anything except that unless he grew taller than his neighbors he would die for want of light. Some wise man has said that wood is nothing but air solidified by sunshine, but the fir tree knew that the real work was done by his leaves, and that they had to be where they could do it. So he put all his strength into growing tall, rather than thick, and as fast as his lower branches were heavily shaded by the surrounding trees, they died and fell off, leaving only dead knots. And so it was with the other trees, which is the reason you always see the cleanest tallest ones in the forest, while those that grow alone, or on the edge of the forest where the light strikes their full length, are short, thick and bushy.

At last, however, the fir tree got so well ahead of his neighbors that they could not crowd him at the top, and as he still rather liked to have their shade kill and prune off his lower branches he felt well established in life. The same fight had been fought out all round him, so instead of being part of an undignified thicket of saplings he had for important neighbors only other big trees like himself, not very close together. The countless weaker companions of their youth were dead, fallen and forgotten.

About this time he began to take on habits of his own. His bark got thick and rough and he allowed his most favored branches to grow big and handsome. He had time to look around and see how the world looked, even as far as the ridge from which, as a winged seed, he had flown so many years before. He cultivated acquaintances among his neighbors and their conversation was quite audible when the wind blew. One of the first surprises in this line was to find a tall handsome pine growing beside a nearby stream that was no other

than the first companion of his flight, whom he had left behind so boastingly at the foot of the ridge and whom he had often remembered with some pity.

"There is more than one way to travel," remarked the pine, "and my family has always preferred the water for long journeys. When I left you that afternoon I simply alighted in the creek and swam the rest of the way."

For over a hundred years more there was not much change in the world that the fir tree saw. Underneath, on the floor of the forest, new shrubs appeared and sometimes little trees would start in the lighter places caused by the death of a big tree from windfall or disease. Sometimes, even then, he could see in the distance a forest fire started perhaps by lightning, and he would shudder with fear, but none came near enough to be really dangerous. On the whole, this was the most uneventful part of his life, and at times he was a little discouraged waiting for the chance to do something grand and wonderful.

But all this time, in the world beyond the ridge that made the fir tree's sky line, events were bringing closer and closer great changes in what he should see. The little settlements at Jamestown and Plymouth grew, war was fought with England, and the United States was born. Lewis and Clark crossed the continent and the Pacific Northwest lost its mystery. Trappers came first; then settlers and gold seekers; then railroads, towns and civilization.

And so, at last, men came to the fir tree's lonely valley. At first he was very much disturbed and displeased, for they began to attack the forest with ax and saw and fire. As the little clearings grew, and especially when he heard the axes ring and trees fall crashing to the ground, the fir tree trembled with sympathy and fear. "Shall this be our end, too," he whispered to the pine tree, and the pine tree reproached him for having led the flight from the ridge where they might have been safe. But it was not death that the fir tree feared; it was being destroyed before his ambition was fulfilled. "Did I hide from the birds and mice," he thought, "and fight all my fellows in the thicket, and stand firm against the storm, all so I could do something noble in the world, only to be cut down before my chance has come?"

But no one touched the fir tree, and at last he became more quiet in his mind and slowly grew to take an interest in the happenings up and down the valley. "At least, it is not so lonesome," he said, and he began to find pleasure in watching the life spread out below him. He liked to see the farmers work in the field, the travelers on the road, and the busy trains carrying logs and lumber to and from the sawmill. Above all he liked to watch every morning and afternoon for the children on their way between their homes and school. "They are all doing things," he thought. "I wish I could."

From this the fir tree fell to wondering why these busy cheerful folk should conduct a warfare against his kind, burning the trees in their clearings and cutting the forest to make lumber. At first it seemed mistaken and cruel. But as he watched and wondered, he

came at last to see that it was by this that they lived and found means of happiness. He realized that the forest gave them their houses and schools, their fences and barns. The lumber that went away from the valley on the busy trains built homes and schools for other people on the far-away plains, and in cutting it for them the valley dwellers served the country's good and in return found occupation and market for their crops. The farmers of the valley found their clearings rich and fruitful because the forest had stored plant foods in the soil, and their crops fed the hungry of the world. Even the river that flowed by the pine tree carried traffic on its bosom, and went at last to water the field of the dry plains below, the stronger and the more steadily because the forests at its head prevented flood and fall. Everywhere the forest was the fostering mother, helping man to prosper and be happy.

"Ah!" said the fir tree. "At last I know what I have lived for and am glad. What good can I do standing here until I fall and rot like those I struggled with in my youth? With all my size and strength I should be no better than they. Happiness and good come only from service and what better thing could I do than to make a home for some happy family, or perhaps a school to which groups of merry children shall go playing year after year." And from then on the fir tree knew his ambition and thought of nothing but how happy he would be when he could give warmth and shelter to his friends the children."

It was then that the fir tree came most to fear the forest fire. He had an object in life now, and could not bear to think of being burned, blackened and destroyed, an utter waste in spite of all his long struggles. He thought also of all the people in his valley, their children and homes and industries, and the horror of a whirlwind of flame that might consume them all and leave the green valley a charred and blackened desert. When the dry hot days of summer came, with campers and hunters passing on their way to the mountains, settlers clearing their slashings, and logging engines working busily, the fir tree was much troubled, for he knew that while none of these meant any harm, a moment's carelessness might loose the foe he feared. He watched them all anxiously and was always glad when he saw the fire wardens and forest rangers pass by on their patrols.

Now we are near the end of the story, for it was only last year that what the fir tree feared came to pass. As summer advanced, the woods became dry as a tinder box and daily the sky grew smokier from burning slashings and distant forest fires. Time and again the fir tree saw fires break out around the camps and clearings and only the most frantic work of loggers, settlers and fire wardens kept them from spreading. Once or twice a barn or fence was burned. Sometimes at night a fringe of flame would show on the skyline of some distant ridge, then die as a band of fire wardens employed by the government, the state or the lumbermen, organized their fight and got it under control. The fir tree and the pine tree slept very little and took turns watching.

Then the dreaded day came. All the morning the wind blew dry

and hot and all the trees felt that something was going to happen. It was about noon that a party of campers stopped at the stream near the pine tree and built a fire for lunch. When they had finished and were about to start on, one man said, "How about the fire? Remember the warnings we've seen nailed on the trees." "Oh, it won't spread," said another, "We have no time to waste." So they went on and left the little fire to creep and spread among the leaves. In twenty minutes it reached a pile of brush carelessly left when the road was built, flared up with a crackle and roar, and immediately became a forest fire racing through the woods almost as fast as men could run.

The children at the school-house were first to see it. The teacher sent a boy to the nearest house to telephone for men and send word to the fire warden, started the smaller children home in the care of the older ones, and organized the big boys into a fire brigade to protect the school-house as long as it should be safe to stay. In an hour all the men of the valley were at the fire and the fight was on. They dug trenches to surround it, cut down the dead trees in its path to prevent burning wood from being carried in the wind, started back-fires from clearings and trails to meet it, and sent warning messengers to the homes toward which the wind might drive it should their efforts be unsuccessful. At these homes, and at the school-house, those who could not work at the fire made bundles of the valuable things that could be carried and kept the roofs wet against falling sparks. Even the children worked, for they soon learned that wherever a spark started a little fire in the brush near the house nothing would put it out so easily as a shovelful of dirt.

The fir tree watched it all. He saw the flames leap and curl above the tree tops and the black smoke roll in clouds. Closest of all he watched the school-house and the settlers' homes, and the veering of the wind that alternately threatened them and promised safety. He saw one home go, house and barn and all, and the family that had left it a few minutes before left homeless in the field. Then just as he began to believe that nothing more could be done, and that the campers' thoughtlessness was going to cost all the years of work by the little valley's people, he was conscious of a blinding smoke and draft against his branches. The wind had changed. The fire front toward the clearings could be controlled now. The flames were headed for the ridge and he was in their path.

"It is not the way I had hoped to serve," he said, "but it is better than to escape at their expense." So he faced the fire bravely. In a moment he was lost to sight in a smother of smoke and sparks and thought it was the end. "Good by," he called to the pine tree, which he could no longer see, and if there was any answer it was lost in the crackle and roar.

Although he resolved to be brave to the last, for a few minutes the pain seemed more than he could bear. Then he was greatly surprised to feel a rush of cooler air which carried the smoke before it. In another moment he could look down and see that after all he had been just on the edge of the fire, which was rushing on toward the ridge, and that although uncomfortably scorched he had not really lost

a single branch of any importance. A group of rangers quickly trenched and subdued the flames which still flickered near his roots. The danger was over for the fir tree and his valley, although thousands of dollars were lost before the workers finally stopped the flames on the ridge where he was born.

"At least it will teach somebody a lesson," said the ambitious fir tree, "and perhaps I shall be all the safer until I am needed to do my part in the world." So he waved cheerfully to the pine tree and fell to thinking how nice it would be if they were only ready to take him to make a home for the family whose house he had seen burned.

Whether they were ready, or whether a still greater chance is to come to him, I do not know, but the story of the ambitious fir tree is the story of the service the forests do for us and of our duty to help them in return.

THE NATIONAL FORESTS IN MONTANA.

By Scott Leavitt, Supervisor Lewis and Clark National Forest.

Look about you and you will notice that few things in daily use do not consist wholly or in part of wood. In the house which shelters you, in the things in it which give you happiness, in the making of the thousand articles used in the everyday life of the race, things for our comfort and things for our absolute need, wood is universally used and the lives of mankind have become so dependent upon the products of the forests that one writer has said that our civilization is built on wood. He says strikingly: "From the cradle to the coffin, in some shape or other, it surrounds us as a convenience or a necessity." This being true the question of a continuous supply of this most necessary commodity becomes a very important one.

Several years ago some of the clear sighted men of this country saw that the supply of our timber was being used and destroyed much faster than it was growing, and that unless some steps were taken to provide for the future the supply would be exhausted. They saw that the people not only needed wood in a myriad of ways but that the wages of over a million and a half of men and women in the United States, probably one in every sixty or seventy of our population, were paid by the businesses which depend either wholly or in part on wood, and that many more were supported by those thus employed. They got together figures, and they found that over twenty billion cubic feet of material was being taken out of the forests each year while only seven billion feet was growing there, and that, in spite of the fact that there were still forests on vast areas of the United States, they were being used up so rapidly that the time could be foreseen when the output of wood, lumber and other forest products would begin to dwindle. There would no longer be new forests for the mills and factories to move to as those of Michigan and Wisconsin had been moving to the west. It was as though a man who had fallen heir to a sum of money was spending every year three

times as much as the income of his fortune. Of course, his wealth would finally run out and he would be poor.

When the eastern states were new vast forests stood in the way of making farms and homes, and it was necessary that the timber be cut down. For much of it there was no market, and so it was burned to get it off the land. Thus as a nation we got the habit of thinking that the supply of trees could not run out and lumbermen wasted much and left brush and tops for fires to run through and devastated much more. Where men are cutting for only present gain this waste still goes on. The young nation found itself with such wealth that it could not appreciate its value. But when the nation had, by its rapid growth and the decrease of the forest lands, passed the stage where the trees had to be cut to get them out of the way and had begun to spend its forest wealth faster than it grew, it was indeed time to think no longer of how to get rid of the forests but rather of how we might keep from becoming actually bankrupt of our timber. The man, even with a fortune, who spends three times his income every year must either increase the income or reduce the amount he is spending. If he does these things properly his fortune will not run out, and he can enjoy it through his own life and then pass it on to those who come after him. In the same way the nation has found that it must look well to its fortune of timber, lest it become bankrupt and in need. It was seen that what timber was left in the hands of the people, wherever it existed in large enough bodies, must be put under good business management, that it might be protected as well as possible from fire and that it could be cut in such a way that the supply would not run out. So necessary did this come to seem that one of our presidents said that the forest problem was in many ways the most vital internal problem of the United States.

When laws were finally passed making it possible to put these areas of public forest lands under business management, Montana was more fortunate than the older states to the east which had used up so much of their fortune in timber. In Montana there were still great areas of mountain land better fitted to grow timber than to farm and not yet come into the hands of private owners. There were other western states in the same condition but, taking the country as a whole, four-fifths of the timber had already passed out of the ownership of the government and the states and only one-fifth yet remained under the direct control of the people. This made it especially important that what forest land yet remained should be made to supply all the timber possible for all time. So the central government and the states set about the task of making the most of what was left. In Montana, both the state and the nation went to work with the same idea, that of handling their forest lands to the best interests of the people. As a member of the Government Forest Service I shall speak principally of the handling of the National Forests in Montana and of what they mean to our state.

There are now in Montana the headquarters of seventeen National Forests and an area of over nineteen millions of acres of National Forest land. There is, however, enough privately owned land within

these Forests to reduce the area actually belonging to the country to about sixteen million acres; but even this is a vast amount, and the benefits to the country must be great indeed to warrant the holding of so much land. Let us, then, consider what these benefits to the people are, and why the people must retain control of their forests to protect the country from a final timber famine.

Private ownership generally has but one aim, and that is present gain. This is natural and to be expected. Only one acre in each one hundred of private timber land is being handled with the idea of a future supply. The owners are beginning to keep out fire, and this will prolong the supply, but it is plain that the government and the state must rely upon themselves to protect the present timber of the public lands and look out for the welfare of the nation. The Forest Service is therefore undertaking to handle the National Forests so that the supply of timber on them will never run out. It believes that good government and good citizens have not only a debt of gratitude to the past but a duty to the future as well, a duty to leave the rich resources of our country in as good condition as possible for those who come after us, while at the same time we of the present are using the timber and other wealth of the forest lands to the best advantage. To see if it is possible to make forest lands yield always, let me make an illustration:

Let us suppose we have an ideal tract of forest land, having on it seedlings one year old, seedlings two years old, others three years old, and so on with each age represented until we have on the tract trees of every age between one year and one hundred forty years. Let us say that the timber in question is lodgepole pine, of which there is such a quantity in Montana. The trees one hundred forty years old are full grown, and let us now suppose that we cut them. We will be careful not to destroy the other trees, and we will cut off the tops and limbs and pile the brush away from the young growth, and then when it is safe we will burn the refuse so that it is not on the ground as a fire danger. If the trees are not naturally replanting, we will also replace the trees cut with young ones enough to be sure that at least one grows in the place of each one felled, and we may even be able to increase the number. Now, suppose also that this area is watched so that no fires get in. Can you see any reason why we could not cut full grown trees from the area every year for all time? Trees grow by the same laws that govern the crops of the farmer except that it takes longer to mature a crop, and the forester attempts to manage the forest so as to harvest a continual crop, just as the farmer takes care of his farm and plants and harvests. With proper handling the farm produces year after year, and so will the forest.

Of course, the National Forests are too big and the development of them is not yet far enough along to make possible the handling of every acre on them as I have outlined. I have given only an illustration to show the plan of forestry. But the underlying theory is in use every day on the National Forests. When timber is sold, as it is continually under bids and at private sales, forest officers mark for

cutting only the timber ready for cutting and protect the young trees for a future supply. The brush is disposed of so as to leave as little danger from fire as possible. In this way over fifty-seven and one-half million feet of timber was cut under sales from the National Forests in Montana during the fiscal year of 1911, and nearly nineteen and one-half million feet was given away under free use. It is safe to say that proper handling will enable the National Forests of Montana to yield over ten times that much every year for all time. This means that there will always be at the very door of the people of Montana a storehouse of lumber, of wood, of posts and poles, and of mining timber to supply our needs. It means much for the permanent prosperity of the whole country, but it means much to Montana in particular, since the supply is so close at hand. It ensures us sufficient timber for our needs in the future as well as the present.

To keep secure this wealth of the people, a guard of men has been organized to administer the general business of the forests, to discover and attack the fires and to prevent as many of these fires as possible. Men ride through the forests and watch from mountain tops, and they summon help when needed. They help build trails and telephone lines to make attack more rapid. On all the National Forests of the country together these men discovered and held over three thousand fires to an area of less than five acres each during the fiscal year of 1911, and many of these small fires would have been large ones had not the men been alert to catch them in time. They thus caught more than three out of every five of the fires which started on the National Forests that year. Others which reached larger proportions they fought until they were out. If there could have been more men on guard more of the fires could have been extinguished when they were small.

We have said that we must also increase our income of timber. It is probable that in time we will also have to reduce the amount used per capita, since the timber owned by private men and companies is being cut so rapidly. The burden of production will finally fall on the publically owned forests, and when this is necessary we must be ready to bear the burden. Do you know that in America in 1909 we were taking two hundred thirty cubic feet of timber from the forests each year for every person living in the country while in Germany the people were getting along with only thirty-seven cubic feet, in France with only twenty-five, and in Great Britain with only fourteen? This use of timber in our country did not consider the amount destroyed by fire, but only that actually used. So if we can keep out the fires and handle what timber is left properly, we can do much toward providing for the future. The task of increasing the production of our forests is being undertaken by applying the principles of forestry: by leaving seed trees to replant naturally areas where cutting is done; by encouraging valuable kinds of timber which grow faster than others; by thinning crowded areas so that the trees will reach greater size; by gathering and sowing tree seed on open tracts; by raising and planting seedlings of lumber species where nature is not doing this herself, as where repeated fires have cleared the tract

so that no seed remains. During the year of 1911, over two and one-third thousand acres were thus sown and planted in the Montana Forests alone, and the three government nurseries in the state where forest trees are raised for transplanting have a capacity of over four and one-half million little trees each year. This work of planting is only beginning, but it will help more and more in increasing our wealth of timber.

There is not time to tell you much of how the forest growth protects the heads of the rivers in the mountains by holding the moisture and working to prevent floods. It thus makes the streams flow more steadily, and aids in giving the proper supply of water for the great irrigation projects which mean so much to Montana. The streams also give better water to the farmers, to towns and to cities, and a steadier water power for industries which will build up the state. Neither is there time to detail how the forests are aiding the stock industry by regulating the grazing of cattle, horses and sheep on the National Forest areas so that the forage will carry all it can without being overgrazed, and will thus, like the tree growth, last always and help support a permanent industry. Over two thousand Montana stockmen had permits last year for nearly one hundred forty thousand cattle and horses and over six hundred forty thousand sheep. Each man was protected in his range and the real home builder was encouraged. There are other benefits still, but there is no space to explain how settlers can get the really agricultural lands in the Forests for homes, how the prospector for minerals is invited, how the other resources of the Forests are all available for proper use, and how the state gets one-fourth of all the moneys received for the use of the National Forests within it for the building of roads and the maintenance of schools, a sum which was over seventy thousand dollars last year. This is Arbor Day and we are speaking only about the need, the care, the use and the planting of trees. It is sufficient to say that the underlying idea of the National Forests is the best use of the nation's wealth for the highest good of the greatest number.

The Forests of this state are a priceless good to its citizens and every pupil of the schools, every one of its people, can aid in their preservation. In the awful forest fires of 1910 seventy-eight men died fighting fires within the National Forests and many more were injured, some for life. The loss of property ran high into the millions of dollars. It is an awful thing to know that six hundred sixty-eight of the fires of that year were started by the carelessness of campers. Not all of these fires became large, but the lesson of danger and suffering should impress itself on us all. Many fires are started by lightning, many by the railroads, others by settlers burning brush, and some have undoubtedly been set purposely with a disregard for life and property which seems almost incredible. Is there not a patriotic duty which we can all carry out for our country and our state in helping to save this great and much needed wealth of the people from a destruction carrying with it suffering and death? The fires from lightning we cannot avoid, and we must be alert to control them when

they start, but fires from human agency we can avoid more and more fully as people become convinced of the seriousness and the danger, as they become more and more careful in the forests, and feel that they have a personal interest in the protection of our glorious Forest wealth. Think of these things when you yourselves are in the forests, and also help to create a sentiment which will make others careful too. You will thus be playing the part of true citizens with the good of your country at heart.

NATIVE TREES OF MONTANA.

Yellow Pine—State Tree	<i>Pinus ponderosa.</i>
Lodge Pole Pine	<i>Pinus Murrayana.</i>
White or Silver Pine	<i>Pinus monticola.</i>
White Bark Pine	<i>Pinus albicaulis.</i>
Limbex Pine	<i>Pinus.</i>
Engelmann Spruce	<i>Picea Engelmann.</i>
Columbian Spruce	<i>Picea.</i>

(These two spruces are generally considered the same species.)

Douglas Fir	<i>Pseudotsuga Douglasii.</i>
Alpine Fir.	<i>Abies lasiocarpa.</i>
Lowland Fir	<i>Abies grandes.</i>
White Cedar	<i>Thuja gigantea.</i>
Red Cedar	
Cottonwood, Eastern	
Cottonwood, Western	<i>Populus papyrifera.</i>
Birch, white or paper	<i>Betula papyrifera.</i>
Birch, red	
Western Larch	<i>Larix occidentalis.</i>
Mountain Larch	<i>Larix Lyallii.</i>
Alder	
Ash (in eastern part)	

KEY TO COMMON KINDS OF TREES.

By William H. Lamb, Scientific Assistant in Dendrology.

The following key is intended only as a guide in the identification of the more common kinds of trees. It is based on prominent, distinctive characters which can readily be observed by those who have no special training in botany. Most of the terms used require no explanation.

To use the key, decide first, by an examination of the leaf, in which of the following seven sections your tree belongs; then turn to that section and from the descriptions there given determine what kind of tree it is.

Section.

Trees with needles, or scale-like leaves, mostly evergreens, bearing cones

I

Trees with broad leaves.

Leaves simple

Alternately attached to twigs.

With toothed edges II

Edges neither toothed nor notched III

Opposite on twigs.

With toothed edges IV

Edges neither toothed nor notched V

Leaves compound.

Alternately attached to twigs VI

Opposite on twigs VII

THE CONIFEROUS * TREES.

I. Trees with Needles, or Scale-like Leaves, Mostly Evergreen, Bearing Cones.

A. Leaves needle-shaped.

1. Leaves clustered.

a. Leaves long, from 1 to 18 inches, 2 to 5 in a cluster. Cones large, with many thick, woody scales (Pinus) Pine

b. Leaves short less than 2 inches long) in brush-like clusters of 12 to 40; falling in winter. Cones very small, with thin scales; remaining on tree for one or more seasons..... (Larix) Larch **

2. Leaves single.

a. Leaves scattered around twigs; falling off when dry or dead. Cones elongated, with thin scales. Twigs roughened by leaf-scars.

x. Leaves stiff, often sharp-pointed and more or less four-sided (Picea) Spruce

y. Leaves soft, flat, rounded, or notched at ends, the bases abruptly contracted into thread-like stems (Tsuga) Hemlock

b. Leaves in two distinct rows, one on each side of the twig; falling off in late autumn or winter. Cones small, ball-like.... (Taxodium) Bald cypress

c. Leaves often in two rows on the tops and sides of the twigs; leaves on lower branches mostly flat, those on upper branches stouter. Cones long, erect, forming only on upper side topmost branches; the scales falling off in autumn, leaving spike-like central axes of the cones attached (Abies) Fir

Leaves scale-like, pointed, overlapping closely on flat or four-sided twigs.

1. Twigs foursided. Cones round or ball-like, with small, thick scales; seed with very narrow, hard wings (Cupressus) Cypress

Twigs flattened.

- a. Cones elongated, with only a few thin scales; bent back on branches(Thuja) **Arbor vitae**
- b. Cones round, very small, berry-like with thin scales; seeds with a broad, thin wing on two sides(Chamaecyparis) **Cedar**
- c. Cones berry-like (showing no separation into scaly parts). Leaves either short, scale-like, and sharp-pointed, or much longer, needle-like, standing out loosely, and attached in pairs or in threes on the twigs.....(Juniperus) **Juniper**

* Cone-bearing.

** The larches are peculiar in having single, scattered leaves on the new or terminal twigs produced each season. These should not be mistaken for the "single" leaves borne throughout by other kinds of evergreens.

THE BROADLEAF TREES.

II. Leaves Simple, Alternate, with Toothed Edges.

Leaves deeply lobed, or with large notches.

- 1. Leaves as wide as they are long. Fruit a swinging ball, 1 to 1½ inches in diameter.
 - a. Leaves with finely toothed margins; star-shaped, the divisions pointed. Fruit, bur-like balls, from which, when ripe, small, winged seeds may be shaken. Bark rough..... (Liquidambar) **Sweet gum**
 - b. Leaves with smooth margins, 3 to 5 inches long, pointed lobes, the space between the lobes rounded. Fruit, a rough ball, easily broken when ripe; composed of closely packed, long, narrow seeds which have hair-like bristles at their lower ends and are attached to a bullet-like central part. Old bark of trunks and large limbs peeling off in thin, curled pieces, leaving pale inner bark showing in irregular patches(Platanus) **Sycamore**

Leaves longer than wide.

- a. Leaves large with deep, round-topped, or pointed lobes. Fruit, an acorn, resting in a separable cup(Quercus) **Oak**
- b. Leaves small, with little, sharp teeth on margin. Twigs bearing sharp thorns. Fruit small (like a little apple) round, with bony seeds (hard core)(Crataegus) **Hawthorn**

Leaves one-sided (one side of leaf shorter at base than the other side).

- 1. Leaves large, oval, 5 to 10 inches long, heart-shaped. Fruit, a cluster of small, woody balls ½ to ½ inch in diameter, hanging from a narrow, leaf-like blade(Tilia) **Basswood**

2. Leaves 3-veined at base, with long, tapering points, which generally turn to one side; edges smooth, or with small teeth of uniform size. Fruit, a small berry about $\frac{1}{4}$ inch in diameter.....(Celtis) **Hackberry**
3. Leaves with straight veins, oval; edges double-toothed (little teeth on the larger ones). Fruit in clusters, dry, flat, with papery wings all around the seeds(Ulmus) **Elm**
- C. Leaves even sided (both sides of leaf the same length.)
 1. Leaves oval, evergreen, thick, with short needle-like teeth. Fruit, a bright red berry.....(Ilex) **Holly**
 2. Leaves more or less elongated, with one tooth at the end of each side vein.
 - a. Trees with smooth, bluish-gray bark, and long, pointed, chestnut-brown buds. Fruit, a small three-cornered nut, in a spiny husk which splits open at the top into three parts...(Fagus) **Beech**
 - b. Trees with ridged, grayish-brown bark. Fruit, a large, round nut in a thick husk covered with dense, needle-like spines; the husk splits open from the top into 3 or 4 divisions(Castanea) **Chestnut**
 3. Leaves very narrow, finely toothed. Small branches slender, usually tough. Fruit, a long cluster of little pods filled with "cotton"(Salix) **Willow**
 4. Leaves somewhat triangular in outline, broad at base, large-toothed. Buds of some species coated with aromatic gum. Branches coarse. Fruit, a long cluster of little pods filled with "cotton".....
(Populus) **Poplar**
 5. Leaves oval, pointed, with sawlike teeth.
 - a. Fruit like a tiny pine cone.
 - x. Bark of trunk and branches peeling off in thin sheets. Leaves double-toothed (little teeth on the larger ones). Fruit ("cones") scaly, falling apart when ripe; seeds with gauze-like wings on two sides(Betula) **Birch**
 - y. Bark smooth or broken, but not peeling. Leaves with small teeth. "Cones" hard, woody, not falling apart; seed with narrow wings on two sides.....(Alnus) **Alder**
 - b. Fruit, a berry; fleshy, edible.
 - x. Leaves large, 3-veined at base, often irregularly, deeply lobed; containing milky juice. Fruit similar in appearance to a blackberry(Morus) **Mulberry**
 - y. Leaves small or medium-sized, feather-veined; containing green juice; fruit (cherry or plum) with one seed.

- i. Seed ("stone") flattened. Fruit large and short-stemmed (Prunus) Plum
- ii. Seed round. Fruit small and long-stemmed (Prunus) Cherry

III. Leaves Simple, Alternate, Edge neither Toothed nor Notched.

A. Leaves with deep lobes.

- 1. Leaves with blunt ends (appearing as if cut off), and with two, pointed, side lobes. Flowers tulip-like. Fruit cone-like, pointed, upright, composed of long, thin, overlapping, winged seeds. Bruised twigs have a peppery odor..... (Liriodendron) **Tulip Poplar**
- 2. Leaves with rounded ends; oval, often with a lobe on one side, making the leaf mitten-shaped. Bruised twigs and inner bark of trunk sweet-smelling (Sassafras) **Sassafras**

B. Leaves without lobes.

- 1. Bruised twigs with peppery odor.
 - a. Leaves oval (evergreen in one species) or elongated, pointed, large. Flowers large, at ends of branches. Fruit cone-like with a bright red seed in each division.... (Magnolia) **Magnolia**
- 2. Bruised twigs without peppery odor.
 - a. Leaves broader at top than at the base, 8 to 12 inches long, with very short leafstalk. Fruit fleshy, elongated, 3 to 4 inches long, with thick, brown skin when ripe, and large, bony, flat seeds. Buds brown and hairy....
(Asimina) **Papaw**
 - b. Leaves oval, elongated, 3 to 7 inches long. Fruit, plum-like, round, 1 to 1½ inches in diameter; when ripe, pale orange color; on a very short stalk, surrounded at base with old, hard flower-cup. Fruit very bitter, but edible after frost (Diospyros) **Persimmon**
 - c. Leaves rounded or heart-shaped, 3 to 5 inches across. Flowers pea-like, pink, appearing before the leaves. Fruit, a dry flat pod, 2½ to 3½ inches long; in dense clusters on sides of branches; seeds, hard, small, oblong, ¼ inch long (Cercis) **Red bud**
- 3. Bruised or cut twigs and leaves with milky juice.
 - a. Leaves with narrow points. Twigs bearing thorns. Fruit, a large, orange-like, rough ball 4 to 6 inches in diameter... (Toxylon) **Osage orange**

IV. Leaves Simple, Opposite, with Toothed Edges.

- A. Leaves with large (often lobe-like) teeth. Fruit in pairs, each part with a conspicuous, flat, very thin wing. Fruit matures in spring or in autumn, when it becomes dry and yellowish-brown (Acer) **Maple**

V. Leaves Simple, Opposite, Edges neither Toothed nor Notched.

- A. Leaves very large heart-shaped. Flowers showy, trumpet-like, in large clusters. Fruit, a long, cylindrical pod, 6 to 14 inches long, containing closely packed, flat, dry seeds, with fringed wings at each end (Catalpa) **Catalpa**
- B. Leaves rather small, oval, tapering at base and point. Flowers conspicuous, white (occasionally rosy), appearing with the expanding leaves. Fruit, a small cluster of two-seeded berries, turning red in autumn..... (Cornus) **Dogwood**

VI. Leaves Compound, Alternately Attached to Twigs.

- A. Leaflets small, many, attached along two sides of a main stem. Fruit, a flat, bean-like, dry or fleshy pod.
 - 1. Leaflets with small, wavy teeth. Pods flat, broad, long, often twisted, thin-skinned, with thick, cheesy, sweetish pulp about seeds. Trees with long, keen, branched thorns..... (Gleditsia) **Honey locust**
 - 2. Leaflets not toothed.
 - a. Twigs with pairs of short, keen thorns. Leaflets rounded at ends. Flowers showy white, in large clusters. Pods small, flat, thin, dry, with small seeds..... (Robinia) **Black locust**
 - b. Twigs thornless. Leaflets oval, pointed. Flowers greenish, with violet odor. Pods large, flat, thick, with jelly-like pulp (poisonous) around the large, black-brown seeds..... (Gymnocladus) **Coffee tree**
- B. Leaflets large. Fruit, a hard-shelled nut, with a separable husk.
 - 1. Leaflets narrow at base becoming larger at outer end. Nut light-colored, in a husk which separates more or less completely into four parts when ripe. (Hicoria) **Hickory**
 - 2. Leaflets broad at base, becoming narrower at outer end. Nut dark, rough, in a fleshy husk which is inseparable by any natural divisions and turns black when old. Pith of twigs forms numerous cross-partitions (Juglans) **Walnut**

VII. Leaves Compound, Opposite on Twigs.

- A. Leaflets arranged along two sides of a main leafstalk, with a leaflet at the end.
 - 1. Leaflets generally 3 (sometimes 5), toothed only near the ends. Fruit, a cluster of dry, winged seeds, arranged in pairs like those of maple..... (Acer) **Boxelder ***
 - 2. Leaflets generally more than 3 (3 to 11), and either not toothed or with small teeth. Fruit, a cluster of single-winged, dry, oar-shaped "seeds"..... (Fraxinus) **Ash**
 - B. Leaflets (5 to 9), clustered at end of a main leaf-stem. Fruit, a shiny, brown nut in a thick, warty or prickly husk, which separates into several parts..... (Aesculus) **Buckeye**
- * Boxelder, a true maple, differs from the others in having compound leaves.

SUGGESTIONS FOR A FOREST CALENDAR.

Get some sheets of 3-ply bristol board or mounting board and cut them into sheets of a size which will be convenient for a wall calendar—for instance, 8 by 10 inches. Prepare one sheet for each month. A pad containing the calendar dates may be purchased for a small sum at any stationery store. The pages containing the dates for the various months may be separated and one mounted on each page of the calendar.

Now select some phase or condition of forest life, suitable for study each month. Select, also, certain trees which typify this phase or condition. One tree may be studied each month, or each week, as time offers or inclination permits. The following topics and trees are suggested. Others may be substituted, as desired.

September: "Leaf Fall."

Trees: Walnut, post oak, holly, larch.

October: "The Fruits of Forest Trees."

Trees: Chestnut, hawthorn, Scotch pine, juniper.

November: "The Coats of Forest Trees."

Trees: Sycamore, shagbark hickory, birch, honey locust.

December: "Shapes of Forest Trees."

Trees: White elm, Lombardy poplar, balsam fir, weeping willow, juniper or red cedar.

January: "Lumber from Forest Trees."

Trees: White pine, white oak, cypress, hickory.

February: "Miscellaneous Products of Forest Trees."

Trees: Longleaf pine, sugar maple, tanbark oak, spruce, hemlock.

March: "Tree Planting."

Trees: Pin oak, jack pine, catalpa, ginkgo.

April: "Tree Blossoms."

Trees: Flowering dogwood, red maple, tulip-poplar, magnolia, wild cherry.

May: "Leaves of Forest Trees."

Trees: Aspen, horse-chestnut, cedar, hemlock.

June: "Seeding of Forest Trees."

Trees: Cottonwood, boxelder, basswood, cherry.

The calendar may be used to illustrate these topics in various ways. One way would be to mount on each of the pages of the calendar pictures of one or more of the trees listed under each month, and to write opposite each picture a description of the tree and the interesting thing which it stands for in relation to the topic assigned for that month. For example, in connection with the general study of "Leaf Fall" in September, it could be pointed out that the walnut is a typical deciduous tree; the post oak is a deciduous tree whose leaves, while dying each autumn, frequently cling to the twigs through the winter; the larch is a type of deciduous, cone-bearing tree; while the holly is an evergreen, broadleaf tree.

Additional facts of interest about each tree may be recorded on the calendar. The pupils should be encouraged to watch for peculiarities

in the habits of various trees and report them to the school as for example, when the tree blossoms, when the leaves and fruit appear. Each pupil thus contributing to the calendar might be rewarded by the entry on the calendar of the fact discovered, together with his name as the first one to report it.

In addition to this material, facts concerning the forest in general, learned through actual observation, should also be entered. The teacher may also select from literature quotations about the trees being studied for the pupils to memorize. After each tree has been thoroughly studied, a good supplementary exercise in composition may be had by asking the pupils to write out in story form all they have learned about the tree.

Where pictures can not be obtained, leaves of trees may be pressed and mounted upon the calendar pages; or specimens of the wood used in the same manner. If there is a pupil of artistic talent in the school, water-color drawing of trees, leaves, or fruits will make beautiful contributions to the calendar.

When completed, the calendar may be hung upon the school walls as a souvenir, and it will not only be interesting from that standpoint, but will be instructive as well, and extremely useful for reference by future pupils and teachers.

SUGGESTIONS FOR A FOREST MUSEUM.

Nothing can be of greater benefit to a pupil who is studying about the products of the forest than actually to see and study these products, both in the raw and the manufactured forms. It will be well worth while, therefore, for any school which attempts to study the forest in any manner whatever, to begin at as early a date as possible to collect samples of forest products and other materials which will give information about the industries in which these products are used or manufactured.

Specimens for such a collection may be obtained from various sources. Some may be obtained directly from trees in the vicinity. The local grocery stores, drug stores, or hardware stores will supply a great many. Others may be obtained by exchange with schools in other localities if it is possible to get into communication with them. If enough local interest is aroused in the subject, it will frequently be found that patrons of the school will contribute to the project either by helping to bear the expense or by donating material.

The success of the undertaking will depend largely on how the specimens collected are prepared for use. First of all, they should be carefully labeled so as to tell exactly what the articles are, where they were produced in the raw state, from what trees procured, their use commercially or otherwise, and any other information desirable for reference. Specimens of manufactured products should be arranged in series to show the processes and stages in manufacture wherever possible. A suitable case or cabinet with glass front, dust-proof if possible, will be found extremely desirable in order to protect the

specimens from handling and from dust when not in use. If a suitable cabinet can not be procured ready-made, one can easily be made by any carpenter or cabinetmaker.

Collections of Wood Specimens.

The pupils should be encouraged to make collections of specimens of woods found in the locality of the school. A number of possible ways of preparing and mounting such specimens will doubtless suggest themselves, but the following method is recommended as likely to prove convenient and satisfactory.

1. Whenever possible, use seasoned woods for the specimens. If nothing but green wood is available, cut rough sticks and allow them to dry as thoroughly as possible before preparing the finished specimen.

2. Collect specimens as nearly as possible uniform in size and character as to the parts of the trees and ages of the trees from which they are taken. If some are taken from the branches and some from the trunks, or some from young saplings and others from old trees, they should be marked accordingly.

3. For each specimen, select a stick about 2 or 3 inches in diameter and cut from it a section about 4 inches long, sawing the ends squarely across. Split or saw this block through the center and smooth the split or sawed surface so as to show the grain longitudinally. Beginning about 1 inch back from the end on the bark-covered surface, cut with a sharp knife out to the end at the flattened surface, so as to slope one end. Now, if the wood is thoroughly dry and well seasoned, sandpaper the flat surfaces well. If it can be done, it will add to the appearance of the specimen to apply a single coat of thin varnish or shellac, so as to bring out the grain. The specimen is now ready for mounting.

4. Probably the best plan to follow in mounting a specimen is to insert a small screw eye into the square-cut end of the block prepared as above described, and hang it on a hook in the wall or in a cabinet. This will make it possible to take the specimens down for use in the classroom. It will also be possible to pack them in a small space, if it is desired to move them about.

5. Great care should be taken to see that each specimen is properly labeled. When the sections are first cut they should be carefully marked so as to make it easy to identify each one, and these marks should be kept on the specimens until they are finally labeled. The label should state the name of the tree; whether taken from trunk or branch; whether from an old tree or a sapling; locality and habitat; and, possibly, a brief statement as to the uses of the wood, especially in the case of woods like hickory or oak which are used in making implements, furniture, or other special articles.

Collection of Commercial Products of the Forest.

The grocery store, drug store, and housewares store will yield a great variety of products derived originally from the forest. An interesting plan will be to try to secure samples or specimens of all such products, not only in the manufactured form in which they appear on the market but also in the raw state and in various stages of manu-

facture. A suggestive list of such products is given below:

Food products, such as the nuts and fruits of forest trees; maple sugar and sirup.

Medicinal products, such as quinine from cinchona, salicin from willow bark, oil of sassafras from sassafras bark, etc.

Small household articles, as matches, toothpicks, clothespins, pencils, penholders, tool handles, wooden baskets, shoe pegs, and wooden dishes.

Oils, such as eucalyptus oil, beechnut oil, olive oil, etc.

The products of wood distillation, as wood alcohol, acetates, wood tar, and common potash from wood ashes.

Paper and wood pulp in various stages of manufacture.

Naval stores and their related products, such as turpentine, rosin, creosote, and pitch.

Miscellaneous products, such as cork, tannic acid, charcoal, spruce gum, lampblack, excelsior, etc.

Some of the products listed, such as maple sirup and sugar, turpentine, wood alcohol, and the various gums and fluids, must, of course, be kept in vials, properly labeled. Perishable fruits should be preserved in alcohol in small jars. Other articles, such as specimens of paper or small articles of woodenware, may be mounted on sheets of cardboard, with labels pasted on the cardboard.

The Use of the Museum.

The materials collected for the Forest Museum should be used, not merely displayed. As far as possible the specimens should be so prepared that they may be handled and closely studied by the pupils without injury. Interest soon wanes in blocks of wood or samples of wood products shut up behind glass cases or protected by the warning sign of "Hands off." The child wants to handle the objects he studies, not merely to gaze at them through panes of glass. The materials should be gathered by the pupils themselves as much as possible. They should be encouraged in thinking of the collection as their museum. It would defeat this aim to deprive the pupils of the privilege of using and handling the specimens, since they could not but feel that they have a right to use what is their own.

Of course there will be some specimens, the rare or delicate ones, which will not bear handling and must necessarily be used for display only. But the real value of the museum will come from the "working collection." It is suggested, therefore, that the wood specimens, the samples of wood products, the sets of pictures, or whatever material be obtained for the museum, be prepared and arranged with the aim of use constantly in view. If, in addition, provision can be made for the display of the materials when not in use, this should not be neglected. But at all events the use of the materials should not be sacrificed for the sake of making an attractive display.

LIST OF BOOKS ON OUTDOOR SUBJECTS FOR CHILDREN.

Bird-life	Chapman
Moths and Butterflies	Dickerson
Mary's Garden and How it Grew	Duncan
Brooks and Brook Basins	Frye
Eye-spy	Gibson
Sharp Eyes	Gibson
Our Home Pets	Miller
Grasshopper Land	Morley
Little Mitchell	Morley
Among the Farmyard People	Pierson
Among the Meadow People	Pierson
Among the Night People	Pierson
Citizen Bird	Wright

ADELINE B. ZACHERT,

Director of Children's Work, Louisville Public Library.

SUPPLEMENTARY READING BOOKS.

(There are published numerous books containing stories, poems, or short articles, suitable for supplementary reading purposes with reference to these studies of trees and the forest. The following books have been selected as illustrations. Specific reference to the selections contained in these books will be found in connection with the outlines for each term's work.)

1. McMurray: Classic Stories for Little Ones.
2. Cooke: Nature Myths.
3. Holbrook: Book of Nature Myths.
4. Judd: Classic Myths.
5. Hopkins: The Sandman and His Farm Stories.
6. Chase: Buds, Stems, and Roots. (Vol II, Field and Forest Series.)
7. Wiltse: Kindergarten Stories and Morning Talks.
8. Poulsson: In the Child's World.
9. Wiggin and Smith: Posy Ring.
10. Ford: Nature's Byways.
11. Stone and Fickett: Trees in Poetry and Prose.
12. Stokes: Ten Common Trees.
13. Lovejoy: Nature in Verse.
14. Stevenson: Days and Deeds.
15. Quayle: In God's Out of Doors.
16. Pratt: Little Flower Folk. (Vol. III, Field and Forest Series.)
17. Wiggin and Smith: Golden Numbers.
18. ———: Stories from Garden and Field. (Vol. V, Field and Forest Series.)
19. Dana: Plants and Their Children.
20. Winnington: The Outlook Story Book.
21. Bradish: Stories of Country Life.

22. Boardman: The Lovers of the Woods.
23. Schauffler: Arbor Day.
24. Field: A Little Book of Profitable Tales.
25. Price: The Land We Live In.

REFERENCE BOOKS FOR NATURE STUDY TEACHERS.

Nature study (containing outlines or chapters on forestry, or helpful suggestions on general methods of tree study):

- Comstock: Handbook of Nature Study for Teachers and Parents.
Coulter and Patterson: Practical Nature Study.
Cummings: (a) Nature Study for Primary Grades.
 (b) Nature Study for Lower Grammar Grades.
Holtz: Nature Study.
Hodge: Nature Study and Life.
Holden: Real Things in Nature.
Jackman: Nature Study for Grammar Grades.
McMurray: Special Method in Elementary Science.
Overton and Hill: Nature Study.
Scott: Nature Study and the Child.

Tree Books:

- Apgar: Trees of the Northern United States.
Brisbin: Trees and Tree Planting.
Britton: Trees.
Chase: Cone-Bearing Trees of the California Mountains.
Collins and Preston: Key to New England Trees.
Dame and Brooks: Handbook of Trees of New England.
Emerson and Weed: Our Trees and How to Know Them.
Flagg: A Year Among Trees.
Going: With the Trees.
Hough: Handbook of the Trees of the Northern United States and

Canada.

- Huntington: A Study of Trees in Winter.
Jepson: Trees of California.
Keeler: Our Native Trees.
Lounsberry: A Guide to the Trees.
MacFarland: Getting Acquainted With the Trees.
Mathews: Familiar Trees and Their Leaves.
Maury: The Native Trees of Kentucky.
Mosher: Fruit and Nut Trees.
Mosher: Our Cone-Bearing Trees.
Mosher: Oaks and Maples.
Newhall: Trees of Northeastern America.
Rogers: Among Green Trees.
Rogers: The Tree Book.
Rogers: Trees Every Child Should Know.
Sargent: A Manual of Trees of North America.
Schwartz: Forest Trees and Forest Scenery.

Park and Street Trees:

Fernow: The Care of Trees in Lawn, Street, and Park.

Solotaroff: Shade Trees in Towns and Cities.

General Forestry:

Bruncken: North American Forests and Forestry.

Fernow: Economics of Forestry.

Fernow: A Brief History of Forestry.

Gifford: Practical Forestry.

Graves: The Principles of Handling Woodlands.

Green: Principles of American Forestry.

Roth: A First Book of Forestry.

Wood Structure and Woodworking:

Boulger: Wood.

Foster: Elementary Woodworking.

Hough: American Woods (containing thin sections of various species of woods).

Snow: Principal Species of Wood.

No Arbor Day program would be complete with birds left out. Trees and birds are everywhere associated with each other. To mention one is to suggest the other. Trees furnish birds with homes, shelter, food, refuge and refreshment. Birds return the kindness by devouring the parasites that attack trees, by assisting in the carrying of seeds and thus in the very existence of the trees themselves. Does it seem to you that trees do more for birds than birds for trees? Would you care to live in a country without either?

SUGGESTION TO TEACHERS.

Mount colored pictures of birds upon 9x12 inch green cards. Teach the children to recognize the different birds and to give two or three characteristic habits of each bird.

Present only one picture at a time and teach the name and characteristics of the bird presented before another is taken, as: The robin comes very early in the spring. Robins sing in the rain. Robins say, "Cheer-up! Cheer-up!"

Teach a quotation about the robin and the name of the author.

1. Place the pictures of the birds upon the ledge of the black-board and have the children look at them carefully. Then quickly turn the picture toward the board and ask the children to name them from memory as the teacher touches the card.

2. Place the pictures of the birds upon the ledge of the board and ask each child to describe a bird without naming it, and the others to guess which bird was described.

3. Teacher describe a bird and tell a child to find and name it; as, I am thinking of a bird that can see in the dark and say "Who-oo-oo." Of what bird am I thinking, John? You are thinking of an owl.

4. Name a bird that comes very early in the spring and some-

times builds its nest in a box. Run and touch a bird that catches chickens; point to a bird that sings a pretty song; point to a bird and give a quotation about it.

BIRD STUDY.

In connection with the observance of Arbor Day there should be a more careful study of birds and their relation to human interests, both ethical and material. The protection of our feathered friends is a subject that demands more attention than it has been receiving in this state. Many of our sweetest singers have been well nigh exterminated in some parts of the State, the huntsman and feather seekers having ruthlessly slain them by the thousands. In other places the bluebird is scarcely seen any more, while the oriole and brown thrush are becoming scarcer each year.

To awaken an interest in bird study and especially in the protection of birds, teachers are requested to give attention to the subject by studying the nature and habits of birds common in their section, and to show of what value birds are to the farmer and the fruit grower. It is true that the robin and the cat bird get a few raspberries and cherries, but the amount of fruit they save by the destruction of injurious insects is immeasurably greater than the amount eaten by them. In fact careful examination will show that birds will choose the fruit that is affected by worms in preference to the perfect fruit—a good fat worm being a dainty morsel for his birdship. Akin to this subject we append the following statement recently issued from the Department of Agriculture, Washington:

Great Work of Bob Whites.

The ornithologists of the Department of Agriculture have been making an investigation of the economic value of the bob white, as a result of which it is now announced that that bird is "probably the most useful abundant species on the farms." Field observations, experiments, and examinations show that it consumes large quantities of weed seeds and destroys many of the worst insect pests with which farmers contend, and yet it does not injure grain, fruit, or any other crop.

It is figured that from September 1 to April 30 annually in Virginia alone the total consumption of weed seed by bob whites amounts to 573 tons. Some of the pests which it habitually destroys, the report says, are the Mexican cotton boll weevil, which damages the cotton crop upwards of \$15,000,000 a year; the potato beetle, which cuts off \$10,000,000 from the value of the potato crop; the cotton worms, which have been known to cause \$30,000,000 loss in a year; the chinch bug, and the Rocky Mountain locust, scourges which leave desolation in their path and have caused losses to the extent of \$100,000,000 in some years. The report urges measures to secure the preservation of the bob whites in this country.

What is true of bob white or the partridge is equally true of a number of our common birds. If the destruction of our birds con-

tinues the farmer and the fruit grower will have a more difficult battle each year with insect life, and finally their inroad will be so great that it will be almost impossible to overcome it.

THE VALUE OF OUR WILD BIRDS.

By William L. Finley, State Game Warden of Oregon.

The natural checks upon insect life are the wild birds that live in our fields and forests. If we were to kill off the birds of a certain locality, we should immediately overthrow the balance of nature and there would be a corresponding increase of insects.

For years our wild birds have been rapidly decreasing. As a result, millions of dollars are taken from the pockets of the farming class every year to fight insect pests, and this amount is increasing. The inroads of the Hessian fly upon the wheat crops in 1904 were estimated at \$50,000,000. The cotton worm is a great menace in the south; it destroys from \$25,000,000 to \$50,000,000 annually of the cotton crop. The cutworm is a pest that is prevalent throughout the country; although the loss is widely distributed and not felt so heavily, it is enormous. The codling moth injures fruit crops to the amount of \$20,000,000 annually. With the continuous destruction of bird life in our country, the loss from insect and rodent pests last year is estimated at the enormous sum of \$800,000,000.

Without the wild birds, our forests would be swept as by a blast of fire. Our trees would look like an army of telegraph posts. The importance of bird life in conserving our forests may not be well known. Last year insects caused an estimated loss of over a hundred million dollars to the trees of the country. Do you know that four hundred different species of insects are continually working on the oak tree alone? The birds of the forests are constantly catching and consuming these insects. On the willow trees, 186 different kinds of insects are constantly at work; on the pine, 165 species; on the hickory, 170; on the birch, 105, and on the elm, 8. Careful analysis of the stomachs of thousands of woodpeckers, titmice, creepers, kinglets, wood warblers, wrens, fly-catchers, swallows nut-thatches and other birds show that they do nothing else but eat these devastating insects. This is their life work. Destroy our wild birds and you destroy our forests.

When the white men came to the Pacific Coast and began cutting away the forests and plowing great stretches of land, it naturally made some changes in the bird and animal life of the country. Instead of living on the seeds of wild weeds and grasses, the birds soon found a new and abundant supply that man planted in the fields, and it is not surprising that many species, such as blackbirds and quail, took to living on the new food that man brought. Nor is it surprising that one or two species of hawks that were accustomed to live on wild birds and animals took to catching the tame unwary birds that man kept about the yard.

Later on, as the native bushes and trees were cleared away and

even the grain fields gave way to orchards, the birds changed their nesting places to orchard trees and to modern homes and they liked the cultivated fruit better than the wild fruit, berries, and seeds. For this reason birds that were almost unknown came to be regarded by some orchardists as enemies because of the fruit and grain they ate. The change of conditions that made food abundant and gave good nesting facilities and killed off the smaller animals that lived to some extent on birds and their eggs and held the bird numbers in check, naturally gave the chance for some birds to become more numerous. However, there are a few instances where birds become so abundant as to do more real harm than good. For although some of the birds eat fruit, this is not the main part of their diet. The majority of birds are continually hunting and catching insects. During the breeding season, they live largely and rear their young almost exclusively on this food. Wherever insect food is plentiful, the birds resort to such a locality.

We should not lose sight of the ordinary utility of a bird. Too many of us know little or nothing of their real economic value. As a result, we are unjust. We are all too likely to saddle the sins of a particular bird upon the whole tribe. We see a Cooper's hawk swoop into the yard and strike a chicken and we are immediately out with a gun for every other hawk we can see, regardless of the fact that many of the hawks live almost entirely on squirrels, gophers, moles, mice, grasshoppers, beetles and the like, and are among the most useful birds we have. It is a grave error to sacrifice a hundred birds, as we do, for the sins of one guilty bird. A man who lives in the country ought to have a common knowledge of bird habits. For his own good and the welfare of the State, he ought to be able to discriminate between good and bad wild birds, just as he learns to distinguish between good and bad domestic birds and animals.

Because a blackbird is in a grain field, it does not signify that he is doing harm. Woodpeckers are often shot for coming into the orchards, when a careful examination will show that they are destroying injurious insects. There are many instances where birds have been killed because of their destruction to fruit, when an examination of their stomachs showed they were eating more insects than fruit.

The part that birds play in economic life is to hold the balance of nature even by keeping in check the great number of insects and small rodents. They are active every season of the year. Their rapidity of digestion is remarkable. Many young birds digest food in one or two hours. A young bird will consume about ten times its own weight from the time it hatches till it leaves the nest. Birds often raise two or three broods and they perform a great amount of work. Where insect and animal food is abundant, the birds thrive; where it is lacking, nature keeps the bird numbers in check.

In certain places where insects and rodents have threatened crops and become abnormally numerous, the birds soon discover the abundance of food and congregate in large numbers. In this way they help to regulate such outbreaks. An example of this was shown a few years ago in a large apple orchard in central Illinois, that was attacked

by cankerworms. Prof. S. A. Forbes of the State Laboratory of Natural History visited the orchard for two successive seasons and collected various species of the birds found about that locality. An examination of the stomach contents of these birds showed that they were very useful in reducing this outbreak of injurious insects. Out of 141 birds' stomachs examined—including 36 species of birds—it was found that 60 per cent of the birds killed had been eating the cankerworms and of the 36 species 72 per cent were eating worms. Taken as a whole, it was found that 35 per cent of the food of all the birds of the locality consisted of cankerworms. So we find that during this time when the pest got the upper hand, nature used the birds to restore the equilibrium. Birds of field and forest were attracted by the bountiful supply of insect food, and the birds of all sizes and habits were feeding on worms and reducing the numbers.

Out of a flock of 35 cedar waxwings, seven birds were shot. With the exception of a few small beetles, it was found that these birds were living entirely on cankerworms. By actual count, it was found that there were from 70 to 101 worms in the stomachs of each of these birds. If we assume that as an average each of these birds ate 100 worms during the day, the flock of 30 were destroying 3,000 worms a day, or during the month when caterpillars were out the flock were destroying 90,000.

Another instance showing the utility of birds in checking insect pests is shown in the experiments carried on by Prof. Samuel Anghey of the University of Nebraska, during the outbreaks of the Rocky Mountain locust or grasshopper. These experiments were made between 1865 and 1877, and they showed that all the birds of the locality were doing their best to check the outbreak of these injurious insects. Thrushes, kinglets, chickadees, nuthatches, warblers, vireos, swallows, crows, bluejays, blackbirds, kingfishers, cuckoos, woodpeckers, hawk, owls, pigeons, grouse, quail, gulls and even humming-birds and water birds had all taken to eating locusts. Forty-one locusts were taken from the stomach of a single yellow-headed blackbird. A tiny ruby-throated humming-bird had four small locusts in its stomach. Six robins had eaten 265 locusts. Sixty-seven locusts were found in the stomachs of three bluebirds, and one little ruby-crowned kinglet had eaten 29. Many of these and other birds were feeding their young on locusts. One barn owl had eaten 39 locusts. And the hawks were feeding on grasshoppers the same as the owls.

Nature has given the birds a special task of holding insect life in check in order to protect plant life. Some birds live by hunting through the leaves and branches, others by hunting the larvae that are in the bark of the tree trunks, others scratch up the fallen leaves and the loose soil, while others are continually engaged in catching the flying insects.

In a day's time the bush-tit and chickadee have been known to eat hundreds of insect eggs and worms that are harmful to our trees and vegetables. A brood of three young chipping sparrows were watched during one day and they received food 187 times from the parents. A family of four song sparrows seven days old were fed 17 grasshoppers

and two spiders in 67 minutes. The flycatcher and swallows destroy vast numbers of flies and gnats that annoy horses and cattle. The food of the flicker or woodpecker consists largely of ants; 3,000 of these have been taken from the crop of a single bird. The food of the meadowlark consists of 75 per cent of injurious insects and 12 per cent of weed seed, which shows it is a bird of great economic value. A single robin has been known to eat 175 caterpillars. One bob-white that was killed had over 100 potatoe bugs in his crop. Another had eaten two spoonful of chinch bugs. After the day-flying birds have ceased their work and gone to sleep, the night-hawk is busy catching untold number of mosquitoes, moths, and other insects.

Hawks are especially equipped to catch moles, gophers, mice, and squirrels, and they keep these harmful rodents in check. During the summer a pair of red-tailed hawks will destroy hundreds of squirrels, gophers, and mice. The sparrow-hawk lives mostly on grasshoppers, crickets, and mice. One bird that was killed had eaten a gopher and 31 insects. The hawk hunts by day and the owl by night. The work of the one supplements that of the other. Observations show that one owl consumed over 600 mice in 246 days. The barn owl will capture as many mice and gophers in one night as a dozen cats.

HOW TO BUILD A BIRD HOUSE.

From Oregon Arbor Day Manual.

In building a bird house, one should imitate the natural nest or bird home, such as a woodpecker builds, as much as possible; a small round hole is bored into an old tree and then down to a depth of from 6 to 12 inches below the doorway, where the nest is placed. A splendid bird house may be made by taking a cross section of the limb of a tree and hollowing this out, boring a round hole in the side and then adding a roof.

If a bird house is made of boards, old weathered pieces should be used. It is very advantageous to have one side or the top hinged so observations can be made and the house can be easily cleaned after the nesting season. If boards are used, the house can be made to look quite natural by covering the whole with pieces of bark. A narrow slit may be left on each side under the roof for ventilation, but care must be taken not to make the house too light, as most birds like a dark, cosy corner.

The different varieties of birds that commonly occupy bird houses are blue birds, chickadees, white-breasted swallows and house wrens. In cities, a bird house is likely to be taken by an English sparrow. In order to prevent English sparrows from taking bird houses and driving away other birds, the doorway should be made very small, and the house may be either suspended or attached to something so it may swing and sway in the wind—a sparrow does not like to have a house that feels unstable. The opening should be about the size of a dollar for blue birds, but this is also large enough to admit English sparrows; a hole the size of half a dollar is large enough for a wren, chickadee,

and white-breasted swallow, but at the same time is a little small for a sparrow.

Care should be taken to see that the bird houses are placed out of the reach of cats.

THE WOUNDED CURLEW.

Near to the great blue sea, among some rocks, a curlew had built its nest.

The curlew was a sober little bird in its dress of brown and gray feathers.

"He is so sad," said the little waves as they put on their little white caps, and danced toward the shore. "Let us try to cheer him up," and they laughed and sparkled, and threw tiny drops of water at him.

"Here is a present for you," said one little wave, and it tossed a bright piece of seaweed at the curlew's feet.

The great sun, too, noticed the bird, and sent his children, the sunbeams, down to comfort him.

The blue sky bent lovingly over him, but the little bird was still sad, and day after day limped slowly around, for he was lame.

Sometimes he would wade in the shallow water looking for food, but oftener he would stand on some rocky ledge watching the other birds fly.

Sometimes the other birds would stop for a minute and answer his low cry.

How sad he felt then, for he knew that his wings were broken.

Some little sandpipers lived near the curlew, and they often played beside him as if to comfort him.

Poor little curlew! He had always been such a happy bird until that day, when a boy threw a stone at him and hit him, but now he must forever live alone.

"Oh, bright-eyed boy, was there no better way
A moment's joy to gain
Than to make sorrow that must mar the day
With such despairing pain?

"O children! drop the gun, the cruel stone!
Oh listen to my words,
And hear with me the wounded curlew moan—
Have mercy to the birds."

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